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AUTHOR Ziegler, Warren L.; Marien, Michael M.
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ABSTRACT

This paper discusses the Futures-Perspectives in American Education which is a method of educational planning which attempts to comprehensively and systematically speculate about long term possibilities in the educational domain and social environment. Part I is concerned with what it means to think about the future. Methods for thinking about alternative educational futures are presented with the underlying assumptions that education is not an isolated set of phenomenon, independent of other sectors of society; consequently planning must be done in conjunction with speculation about changes in the technological and societal environment which might effect education. Part II reviews the plans of American Education for the future. Five models have been developed to synthesize the major ways of viewing the future: (1) the future as the present; (2) the future as an extrapolation of the present; (3) the single alternative future; (4) the technological future; and (5) the comprehensive future. Part III presents the conceptual, organizational, and methodological problems involved in the futures perspective. Two critiques of the paper are also included. (RSM/Author)

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An Approach to the Futures-Perspective in American Education

by Warren L. Ziegler

Prepared at the
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May 1970

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AN APPROACH TO THE FUTURES-PERSPECTIVE IN AMERICAN EDUCATION

A Review of the Ways in which Educational Planning in the United States Views the Future and an Exploration of the Problems which the Futures-Perspective Poses for Policy, Planning and the Educational Polity

Warren L. Ziegler
with the assistance of
Michael M. Marien

May 1970

Educational Policy Research Center
Syracuse University Research Corporation
1206 Harrison Street
Syracuse, New York 13210

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INTRODUCTION AND ABSTRACT[1]

In the Autumn of 1968 the Center for Educational Research and Innovation of the Organization for Economic Cooperation and Development asked the Educational Policy Research Center at Syracuse if it would undertake the preparation of a paper providing a synthesis of attempts to define alternative educational futures in the United States. It was decided to separate this project into three related activities: first, to discuss what we mean and do when we think about alternative futures; second, to develop a synthesis of work underway in education in the United States in terms of this futures-perspective: alternative goals it might seek, directions it might take, institutions it might develop, and methodologies it might employ; thirdly, to attempt to identify and define the problems for educational planning which might be posed by injecting into that activity a consideration of alternative futures.

These three tasks represent the organizing criteria for the paper. But the analysis has been complicated by the diversity and sheer size of the American education complex and by our judgment that educational planning, particularly were it to assume a focus on longer-term and multi-dimensional possibilities, would take its character from the educational polity and the policy-making function which it serves. Thus, we have been required to consider some problems in polity and policy formulation which also derive (we conjecture) from a consideration of future alternatives for American education.

It should be added that the request was not to provide a "review" of research, but to provide a synthesis of American efforts to define alternative educational futures. A review would resemble more closely an elaborate, critical and annotated bibliography.[2] By "synthesis," we understand an attempt to provide some organizing criteria by means of which one can assess and arrange the enormous range of work underway. Such a task necessarily requires the construction of some point of view--hence, the title of this paper: "An Approach to the Futures-Perspective in American Education."

In Part I we discuss what it means to think about the future. The future is unknowable and unpredictable. But we possess both expectations and intentions about it which, when fully explicated, comprise a series of conjectured alternative states of affairs. Short-term forecasting has become increasingly reliable; but the more remote perspective decreases the reliability of our assumptions about constancy in human affairs.

Next we discuss methods for thinking about alternative educational futures. One assumption is that education is not an isolated set of phenomena, independent of other sectors of the society. Futures-casting must attempt to speculate about changes in the technological and societal environment which might affect education, at least as much as shifts in the demographic and economic factors of traditional concern to most educational planning. How might we judge the plausibility of alternative scenarios? Some criteria for plausibility are discussed. Two forecasting methods receive special attention: the Delphi and the cross-impact matrix methods. They appear to offer promise of systematically generating, explicating, and analyzing a rich mixture of "data" on the future from which we can derive alternative scenarios. But these are forecasts, not predictions. We must still deal, in policy and planning, with the overriding problem of uncertainty in human affairs, which is exacerbated by looking into the more remote future. The futures-perspective increases the necessity to choose among alternatives; but it also attempts to illuminate the consequences of these choices.

The third section focuses on the domain of education in the United States about whose future we wish to speculate. A macrosystems approach is utilized. It enables us to identify the salient features and trends of the education complex. Two major trends are identified: the growth of the "learning force" and the development of a variety of educating institutions and activities outside of the traditional core of formal school systems. The macrosystem is further analyzed by discussing the critical roles of suppliers and beneficiaries (including students) whose effect on possible new directions is important. The noncentralized, pluralistic,

complex web of power and governance in American education forms the critical decision-making nexus within which futures-planning and policy-making will take place.

Part II undertakes a review of how American education plans for the future. Rather than attempting an exhaustive description of planning, we develop five models to synthesize some major different ways of viewing the future. The first model states that the predominant approach is to view the future as not essentially different from the present. Planning, limited by the annual budget cycle to anticipatory administrative behavior, responds to incremental shifts in inputs.

The second model (the "future-as-an-extrapolation-of-the-present") encompasses most of the medium-term education planning in the United States. It describes the behavior of the larger subsystems; e.g., some state departments of education and the U.S. Office of Education. The two major planning variables are the student and teacher populations and the available economic resources. Except for extrapolated shifts in these functions, all other variables tend to be held constant. Examples are given of planning based on social demand, manpower development, and investment in human resources. There is little attempt to forecast changes in other technological, economic, and social forces which are considered exogenous to education. Their potential future impact is rarely taken into account.

The third model is the "single alternative future." Much short-term educational innovation and change reflects client dissatisfaction with the status quo. This dissatisfaction tends to degenerate into a crisis of faith in the core system of schooling. It produces a demand for an alternative, which is really the absence of the crisis in the near future. The model is applied to two major shifts now underway: individualization of instruction and decentralization of school systems. This approach rarely takes into account the future consequences of these shifts on other aspects of education. Moreover, it does not consider the multi-dimensional character of the future (i.e., the exogenous variables) which may well reduce the effectiveness of these crisis-generated, uni-dimensional alternatives.

An important variation of the single alternative future is the "technological future." It focuses only on technological possibilities, but it does project out into the longer term. Examples of radical technological breakthroughs in education are considered. These prophecies, however, do not consider in what ways the educating system must change in order to utilize technologically-prescribed solutions, nor what consequences these technologies might have on the content and objectives of education.

The "comprehensive future" model is the closest to the multi-dimensional criteria we set forth. The few examples which exist include the pre-planning work of the Eight State Project and some educational planning underway in New Towns. Future possibilities, however, are not systematically forecast or analyzed. These attempts at more comprehensive planning still take their main direction from the current scene, although they do attempt to take into account the complex interrelationships between educational and non-educational factors.

In sum, there appears to be as yet no serious planning experience which attempts to speculate comprehensively and systematically about longer term possibilities in the educational domain and its social environment. The reasons for this stem, in part, from problems which the futures-perspective has yet to resolve. These problems, of a conceptual, organizational, and methodological character, are considered in Part III.

The noncentralized, pluralistic character of decision-making in the education complex suggests that these problems extend beyond the boundaries of technical planning, per se. Thus, we describe the educational polity, which consists of suppliers and beneficiaries (e.g., educational clients, consumers, interest groups, etc.). The educating system is perceived by many groups as in a state of crisis, and the polity is fragmenting. The issue is whether a consideration of alternatives to the present might exacerbate this fragmentation, particularly if alternative educational goals are specified. Another issue is how existing educating institutions in the core might react to alternative futures, some of which call into question their future relevance and effectiveness. We speculate

that much educational innovation and change will take place in the periphery, with the creation of new institutions, programs, and methods parallel but perhaps contradictory to the traditional formal subsystems.

Moreover, a clarification and specification of educational goals and values may set the state for proliferation of alternative educational models if the society and the educating system can tolerate diversity. For that to happen, there must be a reconstruction of the polity and the development of new--and the utilization of existing--conflict-resolving mechanisms.

We next consider problems in policy-making, particularly the question of when, where, and how to make interventions. The idea of futures-history is introduced as a major instrument for planning. Futures-history attempts to identify the critical points where policy-making should intervene to bring about a more desirable future among various alternatives. But the more remote the future, the less possible it is to monitor the effectiveness of policy choices and interventions. It is necessary to specify intervention points on the pathways to the future, as well as to increase our knowledge of what is happening in the educational present to identify salient system trends.

The third set of problems lies in the area of educational planning. One technical issue is the need for planning to utilize tools for both forecasting and analyzing a wide array of exogenous variables. A second need is to develop ways to analyze futures-history. A definition of "rolling planning is provided to suggest the cybernetic, circular, and wave-like progression of long-term planning which takes into account alternative futures.

The critical administrative problem is where, within the educating system, to locate the functions of futures-casting and the analysis of futures-history. Two caveats are set forth: first, that surmising forums be politically independent of administrative/policy structures; and second, that their work be broadly disseminated to the educational polity in order to provide a framework of alternative scenarios within which the polity may specify and debate its educational goals.

Finally, we review some recent research done at the Educational Policy Research Center at Syracuse on what kinds of cognitive styles and belief sets are required to think about alternative futures in the longer term. The research suggests that open-minded persons (integratively complex) capable of dealing with ambiguity and uncertainty are better equipped than integratively simple and concrete persons to make forecasts based on conjecture as well as from hard data. The research has implications for the selection and training of future-planners.

In the Postscript, we once again ask what futures-thinking means. The thesis is that it is a metaphorical construct whose value lies in enhancing the ability to make practical judgments and choices in the present. This is the task of policy-making. The futures-perspective might also serve as a powerful tool in the education process itself because the pace of social change increases the pressure to equip students to make choices for the future.

Warren L. Ziegler
EPRC/Syracuse
June 1969

N.B. Since the first draft of this paper was submitted to the Center for Educational Research and Innovation of the O.E.C.D. in June 1969, research then underway at the Educational Policy Research Center at Syracuse has advanced to various stages of completion. This research, with some exceptions, is not directly discussed in the body of this paper. However, it may be of interest to the reader to have a brief review of those projects of the EPRC which relate closely to the main points of this paper and which have reached the stage where at least preliminary results are available.

In APPENDIX C, this brief review is undertaken. Specific research projects are mentioned and relevant Working Drafts and Technical Memoranda are identified. They are available upon request. In this new

appendix, the discussion of projects and papers follows closely the sequence of analysis in the paper, i.e., starting first with methodological advances in thinking about the future, going next to substantive analysis of germane educational policy issues from the futures-perspective, and finally addressing some of the problems encountered in attempting to translate the analytic approach to alternative futures into the operational domain of long-term educational planning for alternative futures.

W.L.Z.
EPRC/Syracuse
January 1970

PART I

THINKING ABOUT THE FUTURE OF EDUCATION

A. The Idea of Alternative Futures

The central assumption of this paper is that we cannot know the future. As de Jouvenel points out,[3] the future lies only (but importantly) in the human imagination. It is not *factum* but *futurum*. We cannot predict the nature of the future, because we have no way of validating our predictions until the future becomes the present.

The attempt to anticipate and control the future is not new in human experience. By definition, planning attempts to anticipate the future and bring some measure of control to its explication. The conduct of daily life would be impossible were we to deny that the future, particularly the near future, did not exhibit fundamental regularities on which we relied because of our knowledge of the present and the recent past. As de Jouvenel has put it, "If society tends on the whole to conserve the present state of affairs, our present knowledge has a high chance of being valid in the future. On the other hand, the future validity of our knowledge becomes increasingly doubtful as the mood of society inclines toward change, and the changes promise to be more rapid."[4]

It has been argued that there is only one future; namely, that future state of affairs that will come about at the point in time when the future has become the present. But even if we could know which state of affairs that would be, the only reason for our attempting to know it would be to alter it by intervening in the present with a view to inventing a different future. If, on the other hand, we view the future as a series of possible, plausible, more or less desirable states of affairs which may, but not *must*, come about, then we are confronted with the necessity of making policy choices

to bring about that future state of affairs which we find most desirable. We are saying, here, more than that present actions have future consequences. We are suggesting that these consequences will influence a number of possible futures which may be more or less likely to come into existence. Thus, it becomes important to explicate, as systematically as we can, the content of the many pictures of the future we hold in our collective imaginations and to choose from among them those which we may prefer to attempt to bring about. Thus, educational planning should not be limited solely to an extension into the future of what we know about the past. It is also an exercise in choosing among many alternative educational configurations and deciding which to attempt to bring about.

What we are suggesting here is that our speculations about the future represent more than an attempt to project into the future our knowledge of the past; they also represent a declaration of our intentions (or desires) as to what the future might become...that is, many alternative possibilities. These possibilities multiply as a consequence of our increasing recognition that "the mood of society inclines toward change, and the changes promise to be more rapid." This implies that we should develop more systematic methods for formulating these possible future states of affairs in order to become better acquainted with the content of our imaginations and to more clearly define the choices before us.

We have said that futures-thinking requires an explication of alternative states of affairs. What does this mean? Perhaps the essential dimension of futures-thinking is that it cannot rely solely upon the extension into the future of data from the past. The techniques available to us for extrapolation become weaker the further into the future trends are extended. In the area of manpower development forecasting, for example, it is clear that as we attempt to deal with the middle-term future, reliance upon manpower forecasts as "hard" data is seriously jeopardized by our inability to identify and explicate all, or even the main factors of change which impinge upon the size and character of this demographic material.

It should be clear that we are not primarily concerned with what is called the short-term. Within the shorter time horizon, it is possible to

make reasonably well-validated and reliable projections if we clearly define the endogenous variables and exclude exogenous factors. In the short-term, for example, manpower and economic projections serve as the basis for a great deal of planning, and not only in the educational domain. Educational planning techniques and models, as well as forecasting instruments, generally focus on a time period whose outer limits are seldom more than ten, and usually five years or less. A good example of the limited time-range of educational forecasting in the United States if found in *Education in the Seventies*, a series of planning papers prepared by the U. S. Office of Education.[5] Rather than describe these as "planning" papers, we would prefer to refer to them as pre-planning documents, containing forecasts based upon the extrapolation of trends, under explicit assumptions, for the 1970-1975 period. The data base is either 1950-1960 or 1955-1965. Models are developed in such areas as educational expenditures; school and college enrollments; and supply and demand of elementary, secondary, and college-level teachers. But even for the seven-year period out to 1975, different assumptions about the "social demand" for educational places, about fiscal constraints, and about "new concepts" in schooling provide widely separated minimum and maximum parameters whose chief characteristic is their uncertainty. Moreover, educational planning in the United states rarely goes beyond the near-term (up to five years), and unlike educational planning in other parts of the world, has generally developed neither the techniques nor, apparently, the intent to plan for the medium- or long-term. Yet even the five-to-ten year range puts the planning process into the realm of speculation, although the indicators are quantified data which create an appearance of hardness and reliability.

The point is that the longer the time perspective, the more uncertain are the assumptions on which linear projections rest, and the greater the "spread" between the maximum and minimum parameters of the extrapolated functions. The reliability of these assumptions decreases because we are less certain about both our expectations and our intentions. As the pace of social and technological change accelerates, educational planning can no longer rely almost exclusively (as it does now) on the solution to economic and demographic equations, "other things being equal," because the "other things" throughout society which impinge upon the educational future will also change.

Paul Alper points out a number of fallacies contained in educational planners' primary reliance on gathering and projecting "hard" data, irrespective of the substantive goal focus of the various manpower or econometric models employed. "Educational planners," he suggests, "should produce results which evidence ranges of assumptions, exogenous variables, and the like, coupled with attached probabilities of outcome, rather than hairline prediction as is done at the present."[6] These suggest some of the requirements for planning which focuses on the medium- to long-term. In later sections of this paper we shall discuss some of the attendant problems for planners and policy-makers and indicate just how unhabituated American education is to considering the "exogenous variables" as it projects itself into the future, or even as it attempts to resolve current crises.

We are forced, then, to conjecture not only about the demographic and economic parameters of the future, but also to include an estimate of the future social order in all of its dimensions (i.e., technological and scientific, economic, political, social, cultural, normative and ideological). That estimate, since it will explicate our intentions, as well as state the limits set by extrapolations of past trends into the future, must inevitably produce a series of alternative futures. The question is, can these alternative futures be formulated in such a way as to increase the likelihood that educational policy-makers and planners will use them?

B. Methods for Thinking about Alternative Futures

Only within the past fifteen to twenty years has the attempt been made to bring some system to the exercise of speculating about the future. A number of alternative and supplementary methodologies have been developed. Among these are: a) the construction of coherent scenarios of the future; b) contextual mapping; c) the Delphi method; d) the cross-impact matrix method; and e) system forecasting. The Educational Policy Research Center at Syracuse (working with the Institute for the Future), since its inception in 1967, has been attempting to employ these methods to develop alternative conjectures about the medium- to longer-term to provide pictures of possible future environments for education. Into these, alternative educational poli-

cies can be imbedded and their consequences explored. Central to this approach is the recognition that education, whether viewed as a dynamic system of inputs and outputs, or in terms of the goals it seeks and the values it supports, or as a process in which certain (formal) kinds of learning occur, is not an isolated phenomenon separate from what goes on in other institutional orders and in the symbolic life of the society.

The policy determinations of the past that led to the present configuration of education did not (and probably could not) take into account the sweeping effects of world-wide change since the Second World War. Efforts are underway to collect expert scientific, technological,and societal forecasts up to and beyond the year 2000. These conjectures, we think, present additional evidence that educational policy formulation and planning must begin to take into account the total environment of the future. Otherwise, the preparation of our current crop of students (numbering now some 25% of the American population) might well find their knowledge, capabilities and skills irrelevant to the demands of the future. They may be rendered incapable of exerting influence on what that environment might then become. It is a sobering thought for educators and planners alike that current students at the primary and secondary levels in America (numbering approximately 50 million) will just be coming into positions of responsibility at the turn of the next century.[7] Moreover, the tens of millions of youngsters who will begin their formal schooling under the influence of "plans" now under formulation will live out the greatest part of their lives in a world beyond the year 2000. Some features of that world, if the past twenty years hold any clues, may well be dramatically, perhaps traumatically, different in degree and in kind from the present. At the moment of this writing, the staff of the EPRC, in cooperation with the Institute for the Future, is generating Delphi forecasts of events and trends in bio-medicine and in social affairs, and is attempting also to systematically conjecture about the possible <u>social</u> consequences of break-throughs and innovations in technology.

We have already posed the crucial question of whether the idea of alternative futures can and will be used by educational policy-makers and planners. Subsequent sections will deal with the operational aspects of

this question more fully. But it is clear that decision-makers will incline to disbelieve or disregard alternative pictures of the future unless the plausibility of these scenarios is strong. How then might we judge this plausibility...indeed, what might we mean by it?

One criterion of plausibility would appear to lie in the richness or completeness of the scenario itself. A description of a future state of affairs which left out some significant set of elements would appear to lack plausibility, because the occurrence of those elements, whatever their nature, might affect the likelihood of occurrence of other events in that scenario. One might ask of a scenario, to what extent do the events and trends thus depicted represent <u>all</u> of the <u>relevant</u> factors necessary to produce a sense of plausibility. It if can be said of a specific scenario that an important factor has been omitted, its plausibility is reduced.

Clearly, also, the notion of <u>probability</u> is a component in a scenario's plausibility. Making estimates about the probability of occurrence of one or another set of events in the future is a process about which we know relatively little. [In Part III of this paper we discuss certain research questions about cognitive styles and affective components which may impact upon different kinds of forecasting behavior.] To some extent, such probability judgments will rely upon the extrapolation of observable and measurable trends, particularly in technological, demographic,and economic areas where the tools for the collection and analysis of data have reached a reasonable level of sophistication. But high-probability forecasts with respect to a set of events do not for that reason alone increase the plausibility of any particular scenario. Life contains many improbable or unforeseen occurrences, some of which may have considerable impact upon what happens. Indeed, the most surprising future would contain no surprises.

Therefore, in reviewing the ways education in the United States takes account of future possibilities, we define the futures-perspective as multidimensional for two reasons. First, different persons hold different views about the future. Since we cannot know or predict the future, we must attempt to explicate the content of these expectations, irrespective of the extent to which they derive from projection or from vision. But secondly,

despite the practice of over-specialization in the social sciences, our capacity to deal systematically with the interrelatedness of events and forces throughout society is slowly increasing. The tools of systems analysis and operations research tend to force the policy analyst to bridge the disciplinary divisions that have separated the social sciences from the philosophic and humanistic disciplines. As we begin to use these theoretical and operational bridges in our conjectures, we are confronted with a variety and richness of human, social, ecological, and technological interactions often neglected by educational planners who are prone to rely upon a uni-dimensional version or vision of the future.[8]

As we study more remote futures, we must rely increasingly upon our ability to speculate systematically so that we can analyze their content and "force" the reasons for the specific conjectures. Among the methods appropriate to this activity, the Delphi method offers a systematic approach to collecting the opinions of experts about the likelihood of specific events (which we use as the indicators of larger trends and social developments). It also provides a framework for developing consensus among experts on the time parameters for their forecasts.[9] The main caveat is not to limit these speculations to a uni-dimensional line of change, but rather to enrich them by initially forcing out into the open all which our imagination and experience can conceive, informed by our understanding of the fundamental trends of contemporary life. A weakness of Delphi as now constituted is that it lacks explanatory power, i.e., it does not require respondents to uncover the grounds for their forecasts.

The second method, the cross-impact matrix, appears to be a potentially powerful tool for generating a rich mixture of interaction among possible events in the future from which we can produce a number of different scenarios.[10] The Delphi provides a way of eliciting judgments from a group of experts about the likelihood of occurrence of any number of specific events within different time periods in the future. It assumes that experts treat each event on a list of items as independent forecasts. The cross-impact matrix raises questions about the possible interactions among these events, which would influence their conditional probabilities. Thus, if we <u>assume</u>, for the moment, that forecasted event A actually turns out to occur at some

specified time, we may then speculate on its potential impact upon the occurrence or non-occurrence of event B, which under Delphi was independently forecast. Will event A, if it occurs, increase or decrease the likelihood of occurrence of event B, and how much over what span of time? Answers, of course, rely upon reasoned conjecture. But by making explicit judgments about the relationships among a series of forecasted events, and by programming the enormous variety of these judgments on a computer, it becomes possible to develop an extraordinary number of possible scenarios of the future. This forms the basis on which we can begin to "test" policy choices and educational plans by carrying out their consequences into these "futures."

To be sure, our understanding of the consequences of educational decisions taken in the present also represents, at best, the more informed conjectures we can make. <u>There is no pretense that the use of these methods can "predict" the outcomes of educational policies, or that we can assure political decision-makers that by paying attention to the future, planners can provide a sure way of controlling it</u>. But the opposite approach--to neglect the future--means that we must construct our policies and plans purely on the basis of present needs and problems, most of which, in any event, emerge from past inadequacies.

This latter approach characterizes most of what passes for educational planning in America. It is inadequate. It implies that technological and social changes and developments will sweep us inevitably into a future state of affairs. We do not, then, choose the future; we adjust to it.[11]

The overriding issue raised by the futures-perspective is our ability to deal with uncertainty and ambiguity. The greater the number of alternatives generated, the greater the strain placed upon our capacity to make sound choices. The development of complex institutions coupled with the application of sophisticated planning techniques represents, in education as elsewhere, an attempt to bring order, predictability and stability to what would otherwise be chaos. In traditional societies, the mechanisms of social control proliferate throughout the symbolic and behavioral life of the society. In more modern, complex societies, with their increased division of labor and specialization of role, the state takes on the function of formalizing and legitimizing the instrumentality of social control

so that there is one identifiable set of institutions to which men can appeal for the adjudication of competing interests, claims, and expectations. Yet the further one casts into the future, the greater becomes the lack of certainty about the dimensions of our expectations and intentions. There is, in other words, a fundamental and dynamic tension between the uncertainty of the more remote future and the need for certainty which action and choice impel us to impose upon the present. It is a tension between stasis and kinesis, between being and becoming, between knowledge and action. This tension is perhaps the single most obdurate problem with which educational policy-making and planning must deal.

C. The Domain of the Educating System

The discussion, so far, has been formulated primarily in theoretical terms. But if the futures-perspective is to be more systematically introduced into educational setting in the United States, it is necessary to provide a conceptual framework for identifying what this setting encompasses. A discussion of how American education might more effectively consider its alternative futures through long-term planning must rest on a useful and legitimate view of the educating system.

A potentially powerful approach to delimiting this domain lies in the application of systems theory. This approach emphasizes the open-ended, macrosystem character of American education, choosing the term "education complex"[12] to signify a massive social system involving all organizations associated with instructional services. This macro-analysis facilitates taking a broad view of education in order to specify the most important interrelationships of the activities which affect the future of the system. It serves, in other words, as a basis for system-forecasting by identifying the salient features and trends of the system. Chart I diagrams this emerging macrosystem.

Critical to this overview of the complex is a recognition that the domain includes much more than the traditional system of schools and colleges. That system, of course, involves the local level, public and parochial, elementary and secondary school systems, as well as private schools,

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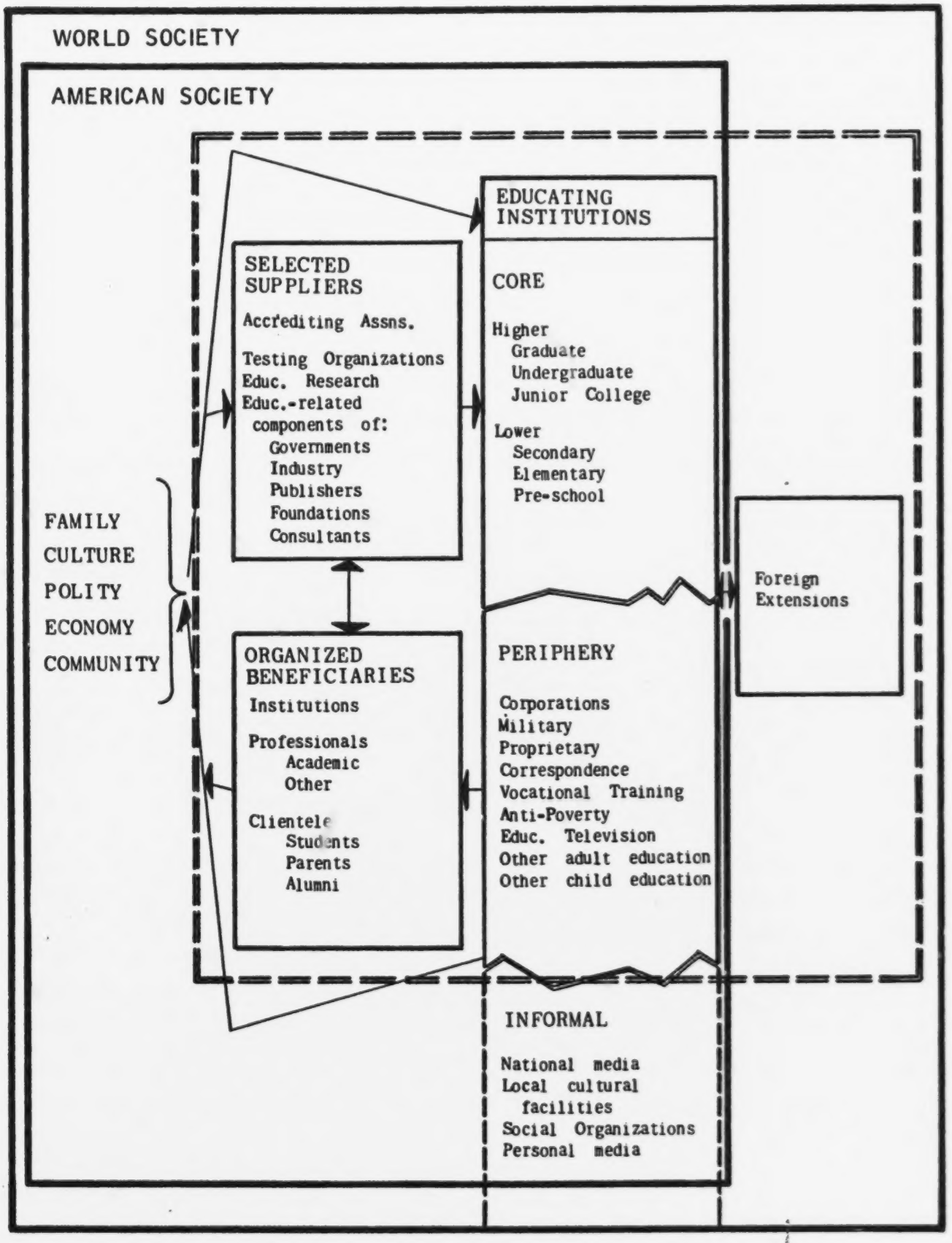

CHART I OVERVIEW OF BOUNDARIES AND COMPONENTS OF THE EDUCATION COMPLEX

Note: This chart is from an EPRC Working Draft entitled "Notes on the Education Complex as an Emerging Macro-system," by Michael Marien, April 1969.

state school systems (including the state departments of education), colleges, universities, and the state university systems. These are the traditional components which comprise the "formal" educational system and which lie at the "core" of the complex.

Growing out of, interacting with, and in important ways independent of this core system are what are called "peripheral" educating activities. The periphery involves the multitude of programs for adult (and some youth) learners, who will soon surpass in numbers the students enrolled in the core institutions. These programs include adult education, vocational education, continuing education, remedial education, training and re-training (including many of the manpower development and training programs), and youth activities. Generally referred to as "non-formal," these programs are sponsored, planned, developed and implemented by business enterprises and industrial corporations, government agencies, the military establishment, educational television--sometimes in cooperation with "core" educating institutions. It is important to note that often the instructional activities are, in fact, as "formal" (in terms of the structure of the teaching-learning setting) as any to be found in the core school programs.

One source of evidence for this critical distinction between core and periphery stems from recent research on the rapidly changing and growing "learning force" in America, particularly as it relates to: 1) changing balances between "work" (i.e., employment for compensation) and leisure, and 2) the impact of technology on occupations and occupational obsolescence.[13] This distinction forces a reconsideration of the domain of American education. The scope of the educational enterprise has come to include a wide variety of "peripheral" activities. This forces us to raise questions about what we mean by education, even in the institutional sense. In considering the many variables which affect the new forms and contents of education, can we limit the discussion of adult needs, attitudes, and roles to the traditional educational function of anticipatory socialization? Here is a totally new agenda for the future of American education, an agenda which, at the outset of attempts to define it, would seem to include all of the factors of technological and social change which pervade human society.

The dividing lines between the core and the periphery are blurred, but purposefully so, because the reciprocal impact of each appears to be increasing. For example, scores of thousands of adults enroll in higher-education programs for career training, refresher training, and skill upgrading, often sponsored and paid for by their employers. Yet degrees can be obtained in this manner, and the impact of adult participants on higher education, while difficult to calculate, may be an increasingly important component of a future scenario of American education. On the other hand, some of the most important innovative work, for example, in such areas as programmed and computer-assisted instruction, is carried on by for-profit organizations, under government contract, for disaffected and disadvantaged youth in the inner-city for whom core institution programs have not been very effective. Thus, a critical factor in the conceptualization of the "complex" is the growing significance of peripheral activities to the core.

One central feature of the complex is the selected suppliers which provide goods and services amounting to billions of dollars to the educating institutions, and which participate in complex ways in shaping the policies which determine the directions of education. On the symbolic side (which extends beyond the boundaries of the ideological and includes the impact of ideas), there are organizations which, though far removed from the classroom and the formal organizational charts of educating systems, appear nevertheless to make particularly influencial inputs. In addition to the many government agencies, which constitute a "legitimizing" configuration of laws, rules, and administrative determinations in providing standards and some program directions, one must also take into account the testing organizations, private accrediting associations, educational research and development organizations, and the education-related activities of manufacturers, publishers, and foundations.

The entire society, of course, has a fundamental concern with the outputs of the formal educating institutions. The society is the receiver of these outputs, although at the present stage of theory development it is not easy to determine the multiple meanings of these outputs which become inputs to other systemic orders of social interrelationships and activities. The current emphasis in educational planning on specific categories of

input-output relationships, such as social demand, rate-of-return, manpower development, citizenship education, or adult literacy, etc., suffers because of its incompleteness. The uni-linear projection or goal focus is an inadequate basis for considering which among the many input-output pathways--social, political, economic, and cultural--expand possibilities or set limits to the future directions education may take.

As a start, however, the idea of the education complex includes certain groups of organized beneficiaries representing various interests especially concerned with education in the United States. Among these are the various groupings of institutions which promote common growth and survival, such as the American Council on Education. Also included are professional associations interested in survival and the growth of the profession, employment conditions, and the production and/or dissemination of knowledge, such as the National Education Association, and clientele groups interested in the various services of educating institutions. These groups (which serve to benefit most by promoting changes which satisfy their interests) are prominent advocates of the single, desirable future which serves as their alternative to present conditions.

This view of the education complex--an emerging social system whose interfaces with the total environment are blurred and changing--facilitates a focus on the many instrumentalities for non-formal learning, from national (or "mass") media, local cultural facilities (museums, libraries, zoos, etc.), social institutions (family, church, politics), and personal media (telephone, mail, etc.). In recent years, opportunities for informal education have increased substantially, especially through the proliferation of television networks and the widespread purchase of receiving equipment. Indeed, the relevance, immediacy, and sensitivity to consumer taste exhibited by the mass media are hastening the perceived obsolescence of educating institutions as the chief source of information about the world. The widespread availability of personal motor vehicles and globe-spanning air travel has granted considerably greater access to cultural centers around the world, thus eroding the authority of the scholar and classroom teacher as a cultural disseminator and giving the complex an emerging transnational character.

Alternative educational futures, to be relevant, must consider trends in this area. New developments, such as electronic video recordings (EVR) which enable cassettes to be played through the home television screen, may have a profound impact on formal education--whether or not educational planning takes these kinds of developments into account. It is not at all clear that the core institutions will be allowed to "invent" the future of American education.

Who will invent the future of education? The answer to that question must take into account the pluralism in the system. In Part III, we shall consider the operational problems which the futures-perspective poses for educational planning. The analysis will partially rest on the nature of the decision-making apparatus. The foregoing brief sketch of the educating domain serves to emphasize the complexity of that apparatus. Planning, whatever its quality, takes place within a complicated set of multiple interdependencies among a variety of institutions, associations, and clients. The web of power which controls education extends beyond the traditional and formal institutions and their administrative apparatus. It includes powerful suppliers and vocal beneficiaries, especially the professional associations, the teachers, and the students, who are demanding (and obtaining) power and participation in policy-making.

Authority and power in this complex are non-centralized. There exists a complex web of educational governance. Its non-centralized character facilitates the participation, through school board elections, through pressure groups, of millions of persons in developing the climate for change, for maintenance, for regression. No one person or office speaks unilaterally for education. The corollary is that, under certain conditions, and particularly when education is perceived as in crisis, a great many people do. Any plan drawn up, any policy formulated, at whatever level or subunit of the system, must take into account, even accommodate, pluralistic interests and goals. The most elegantly constructed alternative futures will never be translated into policy, plan, and implementation unless the affected parties are involved in the deliberations which precede action.

PART II

PLANNING FOR THE FUTURE OF EDUCATION

(A Synthesis of Work Underway in the United States)

In synthesizing the current practice of American educational planning as it views the future, we have developed a taxonomy consisting of five models. They form a set of points on a continuum covering the range of systems behavior in which we are interested. The five models are:

A. The Future-as-the-Present

B. The Future-as-an-Extrapolation-of-the-Present

C. The Single Alternative Future

D. The Technological Future

E. The Comprehensive Future

This taxonomy provides a conceptual framework for analyzing the behavior of educational institutions, at various subsystem levels of complexity, from the viewpoint of the futures-perspective set forth in Part I. As we have pointed out, there is no single, central authority, legislative, executive, or administrative, responsible for shaping American education. An exhaustive description of the general range of planning (and non-planning) practices of the core system alone would include the behavior of literally tens of thousands of units. In the school year 1968-1969 there were about 20,000 public school districts consisting of close to 100,000 elementary and secondary schools. In addition, there were approximately 15,000 non-public (private) elementary and 4,000 non-public secondary schools, as well as over 800 public and over 1400 private institutions of higher education.[14] The models should be judged on the basis of their heuristic value for considering what the educational planning process must do to engage the future in a longer-term and multi-dimensional perspective.

A. The Future-as-the-Present

This category serves as a catch-all for most of what the system itself would call planning. We find it more useful, however, to describe such planning as anticipatory administrative behavior. The two chief characteristics of this "planning attitude" are: 1) that the future is defined pretty much like the present, and 2) the lead-time anticipated, from an administrative and policy viewpoint, is generally one year. The essential point, however, is that the future is viewed, in this approach, as in no fundamental sense distinct or different from the present. This model includes the kind of planning usually done in the greatest portion of the thousands of subunits in the core educational system.

Each of these units possesses administrative authority and financial resources (whether from fees or from the local tax base) to develop at least partial alternatives to its present educational behavior. This is not to discount the restraints upon innovative behavior imposed by higher and broader administrative or legislative units which provide state aid to the local educational establishments and which set minimal standards through their certification and accreditation responsibilities. Nor do we discount the impact of market constraints upon the private and proprietary institutions. The interests of vocal beneficiaries (client groups, professional associations, etc.), suppliers, and other interest groups comprise a rich matrix for decision-making both for creative possibilities (alternative futures) and for political road-blocks to innovation. Nevertheless, some of these educating institutions (small minority) are engaged in planning further into the future. They are seriously attempting to reconsider their goals, and are performing their educational activities in new and different ways.

Probably the severest constraint imposed upon long-term educational planning in the United States is the annual budget, taxing and appropriations cycle. This time dimension so foreshortens the operational focus of educational officials at all levels of the system that it becomes most difficult, administratively and psychologically, for them to think about alternative educational futures over the longer-term. They must fund

operating costs and some capital costs from an annual levy of public taxes and an annual appropriation of public funds. The harried school official is charged with the responsibility of "making ends meet" in a continuously escalating situation of rising enrollments and rising costs. He is not inclined to project this managed chaos very far into the future. Indeed, in supporting the need for comprehensive educational planning at the state department of education level, the Advisory Council on State Departments of Education has urged the U.S. Congress to appropriate federal funds for state education earlier in the fiscal year and "for periods of longer than one fiscal year."[15]

Under this model, decision-making considers the "future" on a year-to-year basis. Anticipatory administrative behavior focuses primarily on annual, incremental shifts of quantifiable inputs: how many teachers are needed at what levels and for which on-going programs or courses; how much money is available for operating expenditures; how many students are expected at the various grade levels; what quantity of instructional materials should be purchased. It is true, of course, that drawing up plans for the following year's expenditures will require weighing certain kinds of alternatives. But these alternative strategies, because they are primarily implementing responses to input variations, deal in the main with acceptable minutiae of an on-going system of education. Even the possibility of introducing new instructional technologies is generally considered in the light of N+1 shifts in allocational strategies forced upon the administrative planning function by the annual budget cycle.

Ad hoc planning of a kind obtains. Annual budgets and program descriptions are planned and determined prior to the commencement of the school year. Most of this "planning," however, represents systemic responses to inadequacies of the previous year's plans and to estimates of enrollments and funds available for the succeeding year. Decisions to introduce, for example, capital-intensive instructional or management technologies (e.g., computers) are based primarily upon fads permeating the larger system. Most subunits throughout the system are "copiers," not innovators. They have not engaged in the long-term planning which provides an opportunity to consider

alternative uses of their capital funds before selecting one alternative with which they may have to live for ten, twenty, thirty or more years.

Even the attempt, so far mainly unsuccessful, to adapt the annual decision-making budget cycle relationship to the new PPBS approach would not appear to alter this situation. In theory, the great strength of the program-planning-budget-system approach to policy formulation and planning is the pressure it puts upon the analyst to more exhaustively identify and compute the cost of the strategic (resource) alternatives available to him and to use the evaluation of program effectiveness to reconsider alternative programs. In itself, this is an important task, for the administrative official rarely explicates fully the reasons for decisions to make incremental shifts in resource allocation and program selection to achieve policy targets. Such explication carries with it the very real mandate to measure the degree to which such targets are achieved, and therefore to evaluate the effectiveness of the planning and program performance. But the public education system in the United States is perhaps the one major institutionalized system in this country which up to now has not been held accountable for its performance and, therefore, has not been made to evaluate itself. That situation, of course, is changing. Performance, particularly among impoverished or disadvantaged groups in the society, is recognized as falling dramatically short of the standards which the society accepts as proof of educational achievement. But PPBS, like the methods of systems analysis and operations research from which it derives, does not seem to provoke, in practice, the formulation of new goals, or even a substantive debate over the relevance of accepted goals. It has not forced its users into an intensive reconsideration of the ends of the system to which it is applied, nor to reconsider the domain (boundaries) of the system. But no consideration of future possibilities, other than as the extension of existing conditions, is possible without entering into a fundamental review and, indeed, redefinition of the goals permitted by or to be sought after in the future.

B. The Future-as-an-Extrapolation-of-the-Present

This model includes the kind of educational planning, some of it out to the medium-term, which focuses on extrapolating into the future demo-

graphic and economic variables of traditional concern to the educational enterprise. Outside of linearly projected shifts of clearly specified demographic and economic functions, the model does not take into account conjectures about possible, probable, or desirable changes in other aspects of education or its broader technological and societal environment. To put it another way, the future-as-the-extrapolation-of-the-present pretty much assumes that the future will not substantially differ from the present except within the limits prescribed by the readily apparent variables selected for analysis and planning. Institutional behavior, in this model, rarely allows itself to be influenced by a consideration of the potentially pervasive consequences of technological innovations, even in the area of instructional technology itself. However, this kind of planning for the future does permit a reasonable degree of sophistication with respect to computint the costs of alternative strategies in resource allocation, other things being equal. But because "other things," to some degree, and perhaps to a dramatic degree over the longer-term, may well not remain "equal," planning behavior under this model does not force planners and policy-makers to systematically speculate about alternative educational goals, about complex quantitative aspects of education and learning, nor about alternative societal futures. But any or all of these speculations might require substantial reformulations of traditional educational programs and the development of new kinds of educational institutions and new ways of educating.

Not unexpectedly, this model describes the behavior of some of the larger subsystems of education which encompass broader administrative or systems responsibilities. It is in the state departments of education, the state university systems, and the United States Office of Education that we begin to find the introduction of this (longer-term) planning which, at least in the formal sense, has been used for a number of years by those nations of the world which possess a more centralized educational authority than, of course, exists in the United States. Even where the higher units of authority provide an ever-increasing amount of funds, such as the state educational authorities, or Congressional appropriations expended through the U.S. Office of Education, they do not exercise control over many significant elements of the educational activity.

Of course, the funding situation is changing. For example, the trend is for the Federal Government, through Congressional appropriations, to finance an ever-increasing portion of the costs of higher education. "The Federal share of the total current expenditures (in higher education) increased from about 15% in 1956 to 23% in 1966, in total funds an increase of 450%."[16] Estimated obligations for Fiscal Year 1967 of Federal funds in support of higher education were of the order of 1-1/3 billion dollars, out of approximately 16 billion, both current and capital expenditures.[17] Total expenditures for higher education, all sources, for 1975 are projected to a low of approximately 31 billion and a high of 35 billion.[18] If the percentage of the government contribution remains the same in 1975 as in 1967, or if the trend towards an increased share continues, one might do well to conjecture about the likelihood of a demand for increased Federal planning in the field of higher education. These trends also hold true for Federal support of elementary and secondary education. The question is, what kind of planning may be undertaken, and to what extent will it tend to further "centralize" the system?

In this model, the future is not generally viewed as qualitatively much different from the present. The emphasis is on a quantitative extrapolation of the present. There is no attempt here to redefine the goals or the domain of education or to reconsider what ends it might seek and in what different ways it might seek them. Rather, the variables of the educational situation included in a five-to-fifteen year perspective (i.e., the medium-term) are exactly those for which certain projective and extrapolative techniques have been developed. The input variables, in the main, are recent trends with respect to the demographic characteristics of the school populations (teachers and students) and the economic resources which may be available for expenditures within the system. The output variables are specified occupational skills and/or projected earning capacities multiplied over time by projected numbers of graduating students. This approach is used as the basis for making capital investments in school construction, seldom for goal redefinition or new program design. As Harvey J. Hartley has put it,

> At the present time, the most sophisticated forecasting procedures of local schools have been developed to make

> pupil enrollment projections and to provide estimates of building needs. Very little has been done in the way of forecasting long-range curricular needs and objectives.[19]

One well-recognized formula in this model is the "social demand" planning sometimes used by state university systems. In the states of California and New York, for example, the remarkable expansion over the past decade in the number of places in state-supported systems of higher education, and the proliferation of new two- and four-year institutions appears to have resulted from a significant increase in the level of educational aspiration held by the public, and the willingness of public officials to provide subsidies to higher education which have in turn reinforced the demand. As Herbert Parnes has suggested, however, "There is a. . . fatal circularity in this [kind of] approach: demands for places is used to calculate 'needs' for education; but society's 'needs' for education determine policy which conditions demands for places."[20] The demand for education is not autonomous. It depends upon education policies which, through fluctuations in tuition fees, subsidies to students and/or institutions, and the actual investment in new facilities, affect these demands.

Particularly when projected out into the future, a planning focus on "social demand" would appear to be substantially inadequate for policy formulation. It does not appear that the various state university systems or the Federal Government have as yet considered the larger consequences of a presumed ever-increasing demand by the citizenry for places in the system. A decade ago the argument was made that an additional four years of formal education beyond grade 12, leading to a bachelor's degree, would produce over the working lifetime of the graduate increments to his income in the neighborhood of $50,000 to $100,000. That economic justification may become illusory if and when a balance point is reached above which the preponderant portion of income-earning adults in this country do, in fact, possess four-year college degrees. Both from an economic as well as from a social-status viewpoint, the increase in equality of opportunity and attainment in higher education would tend to reduce the effectiveness of education as a system for selecting, among all adolescents moving into the ranks of adults, those to whom certain income and status characteristics

may be ascribed. The problem is that such a focus for longer-term educational planning would appear inadequate if we take the view that future society may see substantial shifts in attitudes towards work, leisure, patterns of income distribution, social-class relationships and mobility, to name only a few "exogenous" variables. Planning based upon a uni-dimensional perception of needs, goals, and future environments may be more disadvantageous, not to say dangerous, than no planning at all--at least, with a longer-term perspective.

A second formula for planning among some of the larger subsystems is based on a conception of education as investment in human resources, with a resulting concern for manpower utilization and development. It is, of course, most difficult to anticipate changes in occupational requirements in a post-industrial society, even in the near- to medium-term. Moreover, the formal core system of education does not easily respond to such analysis by developing educational places and programs which fit changing manpower definitions. Indeed, there is increasing evidence to suggest that the formal system of schooling can be neither justified nor planned by rigorously aligning formal educational programs with future occupational requirements.

The human resources investment goal underlies much of the manpower training in America for unemployed or so-called unemployable citizens--those who have been left out of America's post-war economic surge to affluence. These "poverty programs" are not usually developed by core institutions. They have been sponsored mainly by Federal agencies and carried out by a mix of public and private (including profit-making) institutions in the periphery. Some of these programs have been planned (fewer implemented) most imaginatively in order to try to take account of the many non-educational factors which affect social attitudes and learning capacities both among the disadvantaged poor and among potential employers. It is interesting to note that peripheral educating institutions have been more responsive to these educational needs and more open-minded in taking into account a larger number of social, political, and economic factors in their program development than core institutions.

Some of the most substantial educational planning now underway at the state level relies heavily on a manpower development approach, coupled with "social demand" and "rate of return" formulae. One state, for example, has recently completed an extensive projection of demographic and economic factors out to 1985 as the basis for a major upgrading and overhaul of its system of education at all levels. The state is at present among the economically poorest in the nation, as measured by per capita income. Its system of schooling is failing to produce anywhere near the national average of high school graduates who matriculate in or complete a four-year college program or move on for a graduate degree. The state is just beginning to emerge from an essentially agrarian and rural economic condition. Its planning goal is to increase the amount and quality of schooling throughout the system, thereby expecting to raise performances to equal national averages, thus attracting industry (because of the existence of a "trained" manpower pool) on the basis of which all of the indices of productivity and income will, it is projected, move up to national average figures. Specific proposals are made for radically increasing teachers' salaries in order to decrease their "out-migration" from the state, for utilizing state bonded indebtedness capacity to underwrite major capital investments in new higher education facilities, and for developing a parallel line of technical training institutes to perform the job-skill training which the public schools are not doing.

On the one hand, it is encouraging that this state has begun to engage in planning which sets fifteen-year targets. On the other, the goals are to reach unevaluated national norms in purely economic terms, which by 1985 will already have moved far beyond the averages of 1968. There is no such thing as a catching-up process within these time limits. But more important, no forecasts are made or speculations attempted with respect to the character of occupational skills which may be required in fifteen years, or in thirty or forty-five years when the students will be living out their adult lives. There is no attempt to examine the host of nation-wide social and technological factors which might impinge upon any plan directed towards the objective of the state's industrialization and presumed concomitant economic growth. Both regional and macro-economic conditions are assumed to remain constant over time.

A closer examination of the state's extremely high rate of school drop-outs, at both the elementary and secondary levels, indicates a wide disparity of performance between white citizens and black citizens. Also, the rate of drop-out appears to correlate with those geographical sections (counties) which are the most rural and possess the smallest industrial base. In effect, the plan calls for concentrating educational development and industrial growth among the sections of the state which are already the most "modern," the most urbanized, the most industrialized. The plan gives no evidence of suggesting a political forum within which the various elements in the state's population may be included in a discussion and determination of the goals, the strategies, the underlying values, the implementing techniques suggested by the plan. In order to achieve economic parity with national averages, is it necessary for a region of the country to write off its rural sectors? And, indeed, what does economic parity mean, projected out some eighteen years, when the very content and structures of American affluence may change in subtle (or not so subtle) ways? The notion that educational investment and growth can be justified only, or even primarily, on the basis of a rather simplistic set of economic variables restricts the content and objectives of that education to a view of human beings as economic commodities--with skills to sell and income to purchase. The ultimate effectiveness of the planning and implementing performance will be conditioned by a host of non-educational factors (e.g., future choices between work and leisure, between investment and consumption, changes in tastes, political dynamics, technological impacts and breakthroughs). But then, should not these factors be taken into account? Both sophisticated extrapolation of present trends and systematic speculation about future possibilities are necessary for the completeness and reliability of the scenario envisioned by these planners. Moreover, projection of present trends is no substitute for a thorough examination of alternative educational goals and the provision of a forum for their discussion by the public.

Each and every planner and policy-maker possesses, implicitly, at least one scenario of the future in his mind. The problem is to bring it into the open and to subject it to a systematic comparison with alternative scenarios which attempt to take into account non-education factors. The future-as-the-extrapolation-of-the-present model does not do this.

C. The Single, Alternative Future

The chief characteristic of this model is that in at least one, but usually no more than one, substantial way, the educational future is perceived as clearly different from the education past. Generally, the difference between the past and the future is defined simplistically, with the focus on a single goal or set of factors; e.g., better learning performance, more effective teaching, utilization of the new instructional technologies, the end to racial imbalance in the schools, etc. The definition of the future, often only implicit in the policy, plans, or program, is uni-dimensional. The reason for this restricted view of the future is that the new policies and programs are more often than not crisis generated. The future is seen as an escape from the past and present failures of the system. Current crises in American education include: 1) questions of financing higher education, 2) clientele disagreements over educational goals, 3) redefinitions of the polity of education--a question of who controls the schools, and 4) the ubiquitous demand for "quality education." They have engendered an emphasis on problem-solving related to past inadequacies rather than stimulating a systematic and extensive exploration of future needs.

This is not unexpected. A great deal of what is called innovation in education represents incremental shifts in one component of the educating system. Piecemeal changes are much more easily absorbed by existing institutions than more whole-scale transformations. Planning, under this model, views educational change in terms of a single, alternative future which derives from dissatisfaction with the present rather than a consideration of possible future alternatives which might well reveal a new set of policy choices. Consider, for example, recent innovations in elementary and secondary school programs in what is called individualization of instruction. A review of the literature suggests that individualized instruction is a reaction to the judgment of school leaders and parents that a level of performance, on one or more measurable learning scales, is inadequate or unsatisfactory. Since at present individualization of instruction is a major focus for much innovative activity in both the core and periphery of the education complex,

it deserves further discussion. Broadly speaking, it is a response to the crisis demand for "quality education."

Schools which have introduced, experimentally or broadly, a program of individualized instruction, share very little in common aside from this general sense of dissatisfaction. For example, the Tri-School Program carried out by the District of Columbia school system in three elementary schools has been established for students who come from a background of inner-city ghetto deprivation. Their performance on standardized achievement tests is dramatically far beneath the national averages. The educational environment of this new program is purposefully considered child-directed and child-centered in which "children from kindergarten through sixth grade are motivated to learn by the discovery method, to explore and progress, <u>each at his own rate</u>, through a combination of applied technology [--such as the talking typewriter--] and effective teaching techniques."[21] The educational future aimed at by the introduction of these instructional methods and technology is essentially defined as better performance on standard achievement tests, at least equal to national averages.

However, the introduction of new instructional technology as a component of an individualized learning program is by no means restricted to inner-city schools catering to a lower-class, minority-group clientele. Indeed, the introduction of the "new machines," whether or not in combination with a more sweeping redesign of the total instructional program, may be found in other school districts where the performance of students is at least at national averages and which are located in middle-class environments. Two of the most well-known are the elementary public schools in Duluth, Minnesota, and the Oakleaf School in Whitehall, Pennsylvania. They have initiated programs of individualized instruction requiring transformations throughout the curricula and organization: new learning materials, redesigned class schedules, a redefinition of teacher roles and teacher-student relationships, a proliferation of new specialist functions, and a major redefinition of educational "space" and "time."

A much more careful process of research, evaluation, and experimentation with the new instructional technologies is now underway. Enormous problems

in creating the "software" have come to the fore. In the area of developing programmed materials, for example, it has been estimated that the cost of constructing an effective program runs between $2,000 to $5,000 per student hour.[22] Kahn and Wiener have suggested that the currently more conservative statements about the application of computers to the instructional setting appear to run parallel, however, to the curve of invention, application, and wider range impacts in the area of technology generally:

> . . . early in the innovation period many exaggerated claims are made, then there is disillusionment and a swing to over-conservative prediction and a general pessimism and skepticism, then finally when a reasonable degree of development has been obtained and a learning period navigated, many--if not all--of the early 'ridiculous' exaggerations and expectations are greatly exceeded. It is particularly clear that if, as suggested. . ., computers improve by five, ten, or more orders of magnitude over the next thirty-three years this is almost certain to happen.[23]

It is just these potentially consequential effects which forecasters have to include in their speculations if decisions taken in the present are to possess relevance in a future state of affairs...or are to help determine the character of that future.

This brief discussion of individualized instruction as a potential "new wave" in American education raises the question of how educational innovation relates to a consideration of the longer-term alternatives for American education. In a preliminary study prepared for the Educational Policy Research Center at Syracuse on individualized instruction, it was noted that the research literature has not revealed any great definitional clarity.[24] At lease four distinguishable conceptualizations of individualized instruction emerge. These are: 1) the programmatic or systems approach as exemplified by IPI (Individually Prescribed Instruction), which emphasizes efficiency and effectiveness of content mastery by relying essentially on the principles of programmed instruction; 2) Independent Study, which is viewed consistently as student activity in the physical absence of teacher control (though not in the absence of institutional control); 3) Indirect Teacher-Student Interaction which is based upon more student participation in student-teacher interaction; and 4) a combination of aspects of the

first three approaches embodied in non-graded school organizations, which amounts to a vertical pattern of student progression through a hierarchy of learning experiences without regard to grade-level designations.

The implications and consequences resulting from some mix of these four approaches would appear to be complex, important, and as yet relatively unstudied. Yet they affect crucial organizational, teleological, structural, pedagogical, and curricular aspects of the schools. Thorough analysis would also require a focus on a host of issues on the relationship between education and other sectors of the society. That is the problem with a vision of a single, alternative future: it tends to leave out more of importance than it includes.

For example, one could conjecture that the widespread adoption of an individualized system of instruction might mean that responsibility and control of curriculum may pass from the school to the child, or to his parent, or to the individual teacher. The consequences might conceivably have far-reaching impact upon the social structure of the school, the roles of teachers, parents, and administrators, as well as on other educational, industrial, and cultural features of the society of the future. But what may these features be, taken from a non-educational viewpoint? What might be the consequences for the society of an educational system which is aimed primarily at maximizing the development of the individual? Will cognitive and affective characteristics of adults in the 21st century, who have undergone twelve or more years of individualized instruction, "fit" the economic, political, and social patterns of that future? These issues are not considered. They can be considered if we attempt, in some systematic fashion, to: 1) speculate about alternative possible configurations of the larger society in the future, and, on the basis of these speculations, 2) conjecture about the consequences of various mixes of educational goals and programs initiated 20, 30, or 40 years in the past (i.e., the present).

The recent experimentation with individualization of instruction by no means represents the only significant example of educational change which arises from a perceived dissatisfaction with things as they are. Another crisis, for example, is located in the polity of American education, where

the "beneficiaries" of the system are calling for a change in the governance of education. The formal decision-making apparatus of appointed administrative officials and elected school boards or boards of trustees, in combination with the professional bodies of educators and teachers, can no longer (it would appear) maintain their hegemony. There is a loss of confidence in the system among consumer groups, including students. Other groups, newly organized under pressures stemming from non-educational factors, clamor for representation in the decision-making process of the system. The issue (at the surface) is how shall the schools and universities be organized, and who shall control them. More deeply, the crisis of governance perhaps indicates the propensity of American society to attempt to rely upon its educating system to solve a variety of social problems.

It is crucial for an understanding of change and reform in American education to realize how much occurs in response to crises, the dimensions of which are usually not earlier perceived by the officialdom of the system. Moreover, operational solutions not only represent an attempt at political optimization in an expanded or redefined polity, but more importantly they represent a usually simplistic and uni-linear alternative, the chief characteristic of which is the elimination of the current crisis. For example, proposals advanced and plans implemented to decentralize the monolithic, hierarchical structure of an urban school system appear to pay little attention to the non-educational factors which have generated the educational crisis, nor to the future play of these very same factors in a situation which has been altered in one significant dimension only.

Of course, a particular crisis may be so grave that policy must focus on alleviating it, irrespective of what new crises may emerge because non-educational factors have not entered into the decision. For this reason, crisis-generated policies are likely to fail. In the decentralization of the big-city schools, whereby an attempt is made to lodge effective control of the school in its immediate neighborhood, so as to make the curriculum and teachers' behavior more responsive to demands of parents, there is little perception of more fundamental changes (future alternatives) possible, conceivable, or desirable in the larger urban, inner-city environment. The

question, for example, of whether or not we ought to expect ghettos to exist in the magalopolis of the year 2000 (thirty years away when the children now in ghetto schools will be parents and adults) is not often critically considered. In the shorter-term, the possibility of increased teacher militancy or changes in patterns of state financial aid to big-city schools are not always considered, though these may provoke new crises which severely strain the decentralization policy.

Long-term planning, undergirded by systematic speculation about alternative approaches to education within the context of multi-dimensional scenarios on the future, is seldom undertaken. But if we do not attempt to conjecture about the conditions of life in the cities by the turn of the century and attempt to decipher the qualities of life which such future alternatives make possible and more or less desirable, how can we expect to plan for a total educational program which might be relevant to these broader concerns?

D. The Technological Future

The technological model is a variation of the single-future model. It is here considered separately for two reasons. First, the technological future encompasses a much longer time dimension. Second, it explicitly recognizes the heavy emphasis on future technological developments which characterize the approach to the future of a high-technology culture, and to the futures-literature it generates. Indeed, it is in the area of educational technology that scientists, technologists, educators, and futurists generally do not hesitate to project into the long-term. Like the focus on a single alternative future, one critical variable of change, the technological, is assumed as paramount, with all other factors, educational and non-educational, related in a dependent fashion.

The model assumes that technological developments will solve, in the future, the problems and crises of the present. As Kahn and Wiener have put it: "Our capacities for and commitment to economic development and control over our external and internal environment, and concomitant systematic technological innovation, application, and diffusion of these capacities are

increasing, seemingly without foreseeable limit."[25] [emphasis ours] They go on to note, however, that "the capacities of our culture and institutions to adapt to so much change in so comparatively short a time may be a major question; the stresses in domestic policies and in the international system may not be managed sufficiently by meliorist policies."

Consider, for example, an intensive research and design project sponsored by the Educational Facilities Laboratory in cooperation with the School of Agriculture at Rice Institute.[26] The project explored new educational approaches and new ways of housing education without the constraints of the past. The fundamental assumption of the project was that the influence of technology on education and school building will explode in the next few decades. "Technology will exert an influence on education out of all proportion to the influence it presently exerts."[27] Among the technologies designed were drive-in education, the motorized carrel, the shoulder carrel, and the town brain. All of these technological innovations were explored quite free of possible constraints imposed by social, political, and economic modalities in the future.

The shoulder carrel, for example, is a private, air conditioned, electronically controlled booth mounted on the student's shoulders and designed for use either at home or in school. The carrel would bring to the student a vast library of data, electronically retrieved and individually controlled, thus in direct competition and contrast with person-to-person teaching. The carrell weighs about 20 pounds, and incorporates such instructional media as UHF-VHF TV, tapes, records, computer connection, two-way radio, telephone, slide projectors and screens.[28]

On the other side of this individualized electronic man-machine symbiosis is the Town Brain for transmitting "learning" to town residents of all ages.[29] The Town Brain is a central computer bank, a monitoring and programming center electronically hooked up to a variety of audio-visual, computer-assisted communications links ranging from individual, hand-carried consoles, to home installed consoles, to portable conference units and mobile teaching units which permit the development of a total, comprehensive education system independent of classrooms, lecture halls, and permanent school buildings.

Once set free, the developments follow logically: auto links, where educational facilities are made available to private cars with radio, two-way telephones, and charts; home study stations, to permit the home to replace the school house for most educational communication; Life Concitioner Boxes straddling the expressways which facilitate continuous "educational" exchange for all persons in the community--limited only by the amount of material which has been programmed for electronic dessimination, etc.[30]

These electronic education devices, foreseen by proponents and inventors as implementable by the year 1990, represent a technological response to the tradition-bound, non-responsive, monolithic, and generally irrelevant education which, it is held, permeates the existing structure of formalized instruction. There are two problems with these kinds of visionary proposals: 1) How do we get from here to there; e.g., the problem of planning and policy in the complex, pluralistic web of governance in the education system, and 2) What shall be the content and the substantive purposes of high-technology education? What view of the nature of man and his education is presupposed by this kind of arrangement? Do we really know enough about what learning means, and what goals education might seek, to rest comfortably with this full-blown extrapolation of current experimentation and testing of electronic teaching aides? What socio-economic, political, and cultural events and trends are assumed over the next twenty to thirty years which will comprise a societal environment conducive to proposals of this kind?

It is quite appropriate, of course, to formulate alternative technological solutions to the educational problems of the present. But it is crucial to also explicate, as systematically and clearly as possible, the implicit assumptions and forecasts about man and society in terms that allow us to move from the realm of vision, exhortation, and criticism to the realm of planning, policy-making, and implementing. If education is to be illuminated by visions of the possible and the desirable, how do we get from these visions to the humdrum, enormously complicated, politicized arena of the present? What proposals of this kind (the longer-term technological speculations) do not give us is the intricate analysis of futures-history, the multiple steps between the present and this (or some other) vision of the future.

E. The Comprehensive Future

The model of the comprehensive future encompasses a relatively unique activity in American education: some focus on the future, at least to the medium-term, in which the attempt is made to relate non-educational factors in that future to educational policy-making and planning in the present. This new activity is discovered in a few individual subunits which possess some measure of control over immediate factors affecting their situation. It has gone forward primarily in the stage of conceptualization and pre-planning. What will be crucial in these experiments in multi-dimensional goal assessment and alternative strategy consideration will be their translation into detailed plans of action and implementation.

The eight-state project on Designing Education for the Future is perhaps the best example of an attempt to explicate a comprehensive educational future at the pre-planning stage. That project, underway since 1965, has involved education officers at the state, university, and local systems levels from eight Western states.[31] This project has attempted to develop a multi-level focus on a significant number of dimensions of policy-making and planning. It has included some surmising about future technological and social developments and impacts, both within and outside the educational domain; it has set forth the need for a more comprehensive planning approach to the future of education in this regional area; it represents a unique undertaking.

But there are difficult problems yet to be solved. One is the familiar question of span of control--and, we would add, of inquiry. The project brings together eight states, in a regional focus, which possess common concerns about the future of their educating systems. But they possess no common administrative/political structure for cohesive, long-term planning and policy-making which relates the conference activity (the "surmising forum") to the polity, the politics, the budget-making, and the educational resources of each of the thousands of subunits within the region--or even to the eight state education offices.

Moreover, what should be the span of inquiry into the future? How will it be possible to deal effectively with the impacts of societal change on alternative regional futures, and in turn relate these two dimensions to educational goal-definition, futures-casting, policy-making and planning at the state and school district level? The analytic, planning, and political tools are not yet developed which might facilitate more detailed consideration of alternative goals and strategies, and which would encourage policy-makers to turn ideas into action and program goals into consequences.

Among the relatively few examples of the comprehensive future model are the educational programs of a few New Towns. In the strict sense, there are no New Town developments in America; rather, we find up to 200 "new communities" which are not economically separate entities, but are planned to provide a mix of types of housing, commercial and cultural facilities, and amenities.[32] The idea of the New Town, however, encourages a longer-term and more multi-dimensional view of the future of education, because in a conceptual sense (though rarely in practice), a New Town program is presented with a tabula rasa on which it can paint its own picture of the future.

Most new communities in America have paid little significant attention to the possibilities for a thorough-going redesign of the educational system, just as they have paid little attention to alternative future states of affairs throughout society.[33] Their planning has emphasized mainly architectural and ecological design. In Columbia, Maryland, however (which is located halfway within the forty miles that separate urban Washington, D.C., from urban Baltimore, Maryland), an attempt has been made to relate the planning of an educational model to other considerations of a social, political, economic, and ecological nature.[34] The planning of Columbia, Maryland, has been comprehensive, as has been the planning of its educational system. The setting of goals involved, over a two-year period, thousands of local citizens in Howard county (a rural, low-density area in which this new community of 150,000 population is now under development). Planning involved a multi-disciplinary team of experts, including city managers, public health and education specialists, economists, sociologists, etc. In the educational arena, most of the new technologies and instructional systems have been explored, and the design

of the school buildings has focused on maintaining maximum flexibility in the future choice of programs and teacher-student roles and relationships.

Perhaps of greatest interest has been the attempt to interweave the formal, core school system into the entire matrix and ethos of Columbia so that educational facilities and programs are available for the continuous learning of the entire community. It has been decided that the schools should become a central focal point for a variety of activities, both formal and informal, and for all kinds of instructional and learning purposes. The actual implementation of this "New Town" is still in an early stage. Six thousand citizens have moved in already, a far cry from the 150,000 anticipated. The entire population of Columbia, in projection, is viewed as a "learning force" to which the formal school system must attempt to be responsive.

Another New Town, working under greater political pressure and socio-economic constraints due to its urban environment, is Fort Lincoln New Town, to be located within the city limits of Washington, D.C. A serious attempt has been made to conceptualize, at the planning stage, a new and comprehensive system of education.[35] The program has yet to be implemented. What comes through as the salient feature in this conceptualization is the goal of interweaving education, in all of its teleological, systemic, and process features, into the social, economic, and political life of the community, both present and future, "to create a new, totally integrated educational system. . . responsive to future changes."[36] As with Columbia, Maryland, the learners and teachers are the citizens of the community, with their multiplicity of individual needs and goals. Decisions about instructional technologies, building facilities, teacher roles, curricula, and the like, will be made (it is proposed) in terms of the notion that the entire citizenry comprises a total learning force.

Another attempt, still in the pre-planning stage, to view education comprehensively, with some focus on the needs of children who will be the adults of tomorrow, is a document entitled Individualism, Relevance, and Innovation, Goals for the Westport School System.[37] Prepared by a group of citizens who form the Advisory Committee on School Goals for this public school system in an affluent, ex-urban community in the State of Connecticut,

the document has attempted "to identify those major social, political, and economic forces which have relevance to the long-term growth and development of the Westport School."[38]

In summary, the Committee's detailed assumptions about the probable nature and course of these forces are:

- the 'knowledge explosion' with its proliferation of 'facts,' many of which will have a short life expectancy as they are made obsolete by new knowledge;
- a continued increase in technology, automation, and computerization, with their impact on social institutions and value systems;
- substantial increases in per capita and national income, and a marked stability in economic growth;
- a shift toward professional and services employment, and away from blue-collar work and manufacturing;
- work careers that involve multiple changes in occupation and continuing education;
- changes in attitudes toward money, work, leisure, and authority;
- an earlier maturity of children, with a consequent search for responsibility and participation in decisions affecting their lives.
- a heightened emphasis on individualism and pluralism;
- a continuing crisis in race relations and urban problems on the domestic scene;
- growing international interdependence, but a widening of the economic gap between developed and developing nations.

The report goes on to say, "Predictions such as these must be handled with discretion. In the event, many of the details may be proved wrong; and the pace of change is such that new forces may appear on the scene with alarming rapidity. Yet some [emphasis theirs] attempt must be made--

and on a continuing [emphasis ours] basis--to anticipate changes on the national (and international) scene, and to think through their implications for education and our schools."[39] The forecasting horizon is 1980. The Advisory Committee attempts to define school goals with sufficient specificity to facilitate evaluation of program effectiveness in achieving these goals.

The examples of the comprehensive future model in Columbia, Maryland, in Fort Lincoln New Town, and in Westport, Connecticut, well illustrate the other horn of the dilemma raised by the issue of span of control and inquiry. In the case of the pre-planning work of the Eight State Project, there is a large enough regional area of the United States to provide a potential leverage on the larger economic, cultural, ecological, and social forces which will determine the future quality of life within that region. This leverage, were it to be exercised, would be by no means complete, for the interdependence of the region with the larger society, and indeed the rest of the world, is obvious, though their dimensions have never been adequately specified. What is lacking are political and administrative devices to translate the idea of a possibly unique regional quality of life and educating system into policy choice and action. Moreover, for a major (and to a real extent, open-ended) macrosystem of that size, it will probably be necessary to devise new analytic tools adequate for planning.

On the other side of the dilemma lie those communities (at present, very few) which possess a cohesiveness of political and administrative structure and socio-economic environment sufficient for competent educational planning for the long-term future. But they can exercise no significant leverage over the forces which will affect their future. The best that can be hoped for are small variations of adjustment to future forces over which the individual communities can exercise no control. Thus, while these smaller subunits of the education complex can attempt to consider a large number of variables exogenous to the traditional concerns of education, the comprehensiveness of their planning effort is severely restricted. In Part III, we shall address these kinds of problems engendered by the futures-perspective.

PART III

PROBLEMS

Thinking about the future of education in a longer-term and multi-dimensional sense represents, to some degree, an extension of fundamental psychological and institutional behavior. The preceding review of work underway indicates however, how far short of a thorough-going analysis of its future educational planning in the United States falls. If it is desirable to inject a futures-concern into education, the critical issue is how this might be done in a practical way. What kinds of new problems engendered by the futures-perspective? What old problems are clarified or exacerbated?

The logic of the argument in Part I states that there are many future possibilities; that the future of education can be viewed as a series of alternatives whose possibilities and desirabilities we must judge as the basis for explicating the consequences of present policy choices. But to examine the future consequences of these policies, we must imbed them in a future environment whose shape and content are conjectural. There is a circularity here which we nevertheless accept, because it forms the basis of human choice and action. Having adopted some policy subsequent to an analysis of its consequences in various alternative futures, we would assume that its adoption was due, in part, to our attempt to bring about one of these alternative futures. Thus, we intend to impact upon the future, to invent it, to steer our activities in the direction of one rather than another possible future.

But every alternative future opens up new directions we might choose to take. On the one hand, the same policy may produce different consequences in different conjectured futures. On the other hand, the likelihood of the

emergence of different futures (our "probability guesses") would appear to make some goals, values, qualities of life, more achievable and others less. The issue here is one of "fit." The circularity lies in the fact that we attempt not only to fit our goals to one particular future; we shall also, through policy choices, planning, and implementation, try to fit the future, which we cannot know or predict, to our goals.

This circularity imposes a tension upon the entire range of activities which we wish to investigate: the polity of education, the policy-making functions within education, and the planning tools which may be utilized to prepare the ground for enlightened choices. In considering what these problems might be, we have not restricted ourselves to a sole concern with the planning activity. In the education complex, the use of sophisticated planning tools, indeed the whole idea of planning, is by no means accepted throughout the system. Moreover, if planning is to be wedded to the more thorough investigation of the future, it would seem crucial to understand how the polity of American education might react to and participate in this deliberation. In the context of a futures-concern, one cannot consider educational planning problems without taking into account the political and policy-making environment which sets goals and utilizes planning products.

The three elements--polity, policy, and planning--are inextricably bound together by the "political" linkages within the education complex. By this we do not mean political parties or partisan politics. The political character of American education is less formalized and--in the public eye--less accepted than the process of competition among patronage parties for elective office. A fundamental ideological characteristic of American education is its formal separation from partisan politics. "Keep politics out of schools" is an accepted shibboleth. But it has crept in again, through every nook and cranny of the system, because the suppliers and the beneficiaries (the parent groups, the professional associations, the clients and consumers) are all caught up in what happens in American education. Perhaps the most important definition of the "crisis" in American education is that millions of citizens believe that education is in crisis and attempt to define and offer solutions to it. We must then consider what kinds of problems a futures-orientation might raise, not only for

technical planning, but also for the whole process of setting educational policies and for the pluralistic polity of education within which these policies will be accepted, modified, or denied.

A. Problems in the Polity[40]

The American educational polity starts with a group of suppliers (of educational ideas, goals, techniques, and material-financial resources), users (which will include students, teachers, administrators), and beneficiaries (which may include parent groups, professional and institutional associations, employing organizations, and the like). All of these are active parts of the dynamic complex. A particular individual, group of individuals, or even an institutional unit may move from one to another position with respect to the system with that particular ease and fluidity of role-shift which characterizes any complex institutional order. In doing so, their interests change. Under conditions of relative system stability, and where the exogenous environment is also relatively stable, this proliferation of and shift among roles and interests is manageable through a complicated and extensive, but nevertheless legitimized, web of governance.

It is on the basis of their participation in or extraction from the system that one can designate the members of the polity of education. Tradition, equitable exchange of benefits (so perceived), and a legitimized power structure enable the polity to support the goals and programs which define the directions in which the educating system is moving. But if there is a dysfunction within the complex, or a disequilibrium across the the interfaces of education and its larger societal environment, the polity may begin to fragment.[41]

As McClellan has pointed out, the idea of polity assumes the willingness and capability of its members (as individuals and as institutions/organizations, and irrespective of their special role and interests in the system) to engage in a common, rational discourse about the ends and means of education (its goals, its program alternatives) based upon some shared understandings about the procedures by which the policy is to be formed.[42]

It is not necessary to achieve consensus either on the content of or the strategies for these goals. What is needed is agreement as to the basis on which the determinations will take place, and agreement as to which kinds of educational issues to disagree about. It is a special kind of universe of discourse which permits and facilitates consensus about disagreement. Change, produced within or outside the system, often results in a fragmentation of that universe, which is what we see increasingly in American education today.

One major problem is whether a consideration of future alternatives might further fragment the polity. Were this to occur, it would reduce for a time the minimum common understandings without which it is difficult for so complex a system to go about its business. If futures-thinking becomes both more systematized and more pervasive, it may well cause a sharpening of value-conflicts and interest conflicts.

In a stable and tradition-oriented educating system, these conflicts tend to be hidden beneath certain generalities. Goals for education are quite often stated at such a level of generality (e.g., equal educational opportunity for all, or maximization of human potential) that they cannot be achieved. They cannot provide a basis for formulating trade-offs between courses of action. They do not permit effective program evaluation. They tend to hide dissatisfactions and disagreements with the system's outputs. Generalized educational goals are no doubt permissible in an educating system which is not under challenge to adapt itself to changing environmental conditions. The system is then, by definition, in a state of equilibrium: planning and policy can deal with minutiae. But the polity <u>is</u> fragmenting.

Challenges to the goals of education, to specific program content and teaching practices, to the ways school systems and universities are organized and controlled are now everyday occurrences. There are severe shortages of resources as well as disagreements over the portion of total resources to be allocated to education. In addition, either the quality or magnitude of outputs is considered unsatisfactory by some client groups. Under such circumstances generalized goal statements no longer suffice. They are not only inadequate for planning and decision-making; they also disfigure the

real issues, either by covering them over (pretending a consensus where none exists) or by blocking the lines of communication within the polity, including the official apparatus and the client groups.

The increasingly widespread sense of change is not only fomenting challenge to traditional wisdom; it is also fomenting challenge to established authority in the educational system. Various sets of claimants, who do not appear to share a uniform set of values about and goals for education, are increasing pressure to participate in the decision-making network. Organizational authority and arrangements have begun to fracture under pressures from student groups, black militancy, parental groups, tax-payer groups, etc. This is a consequence of the fragmentation of the polity. By offering alternatives, the futures-perspective may exacerbate this challenge to constituted authority. It may produce in the entire polity a more whole-scale consideration of where such authority should be lodged, and of what kinds of groups are to share in governance of the system.

Part of this question centers on the performance of formal, core institutions of education in a time of challenge and change, about which we might begin to speculate. Part of the answer would seem to lie in looking at trends in the <u>domain</u> of education. For example, at what stage, and by what criteria, will the pervasive influence of commercial television be considered an instrument of education? At what stage will the new focus on problems of early-learners shift attention from formal pedagogy and instructional childhood? What are the conditions under which the publication and dissemination of underground newspapers and journals produced by students would be considered an important kind of learning? What are the future criteria for determining the educational aspects of sabbaticals taken by factory workers? What is the likelihood and consequence of shifting religious education (or education about religion) from the domain of the church to the domain of secular institutions? Which sets of institutions shall pay attention to specialized occupational training: the core schools, the employing organizations, others?

In short, what kinds of institutions, old and new, might most effectively do the educating? The futures-approach requires a careful extrapolation of present institutional trends. It also requires systematic conjecture about possible solutions to institutional problems caused by societal redefinitions of the domain of education. Twenty years from now, when we talk about education, what will be the content and focus of our discussion? But the question of alternative institutional arrangements has consequences for the present behavior of core institutions now charged with much of the responsibility for educating. This kind of conjecture may well call into question the efficacy and even the perpetuation of historically sacrosanct institutional arrangements and organizational subsystems.

In Part I, Section C, we indicated that a multitude of new institutional arrangements have been established to cope with educational problems arising from the failure of formal, core school systems to provide effective learning for members of minority groups--the so-called "poverty programs." These programs have expended hundreds of millions of dollars. They have provided an opportunity for testing many new instructional motifs and educational management techniques. There have been efforts to evaluate results. Are specified output targets being met, and if not, why not? What kinds of learning are occurring through what kinds of programs and under what kinds of conditions? A new kind of accountability has begun to creep into education by way of new institutions at the periphery. These kinds of innovations will inevitably raise questions about the feasibility and desirability of shifting an increasing portion of the burden of formal, core education to profit-making and/or community-organized institutions outside of the traditional school system.

In what ways, then, and to what extent can one expect persons and institutions charged with the formal responsibility for education to call into question their justification for existence? What use would such an arrangement of people and institutions make of a series of alternative educational possibilities provided by a "surmising forum" of experts, if the alternative scenarios included some which appeared to violate the self-interests of existing institutional arrangements?

In part, the problem lies in the area of institutional maintenance and change. From a behavioral viewpoint, organizational change within the core system of education has been a slow process. It will be extremely difficult for the formal educating institutions, en masse, to begin the arduous task of consciously self-imposed re-examination and change. It would appear much more likely, in the short run, that new institutions and organizations will emerge and engage in types of educating activities which the older, more traditional institutions cannot do, thereby existing parallel to the core.

The futures-perspective may well require new communications mechanisms to facilitate reasonable dialogues about goals among different groups in the polity. One real possibility is that no over-all consensus may emerge. Differences of perspective, life-style, and experience may become intensified by giving clarity to the future implications of present disagreements. Putting it another way, alternative futures may rank differently on different preference scales. And one requirement for translating conjectures about future educational alternatives into present policy choices is to adequately define preference scales on the basis of which alternative goals and their consequences can indeed be evaluated.

But can a complex, interlocked, technologically advanced society of increasing population density permit significant differences in life-styles and, therefore, significant differences in modes of education. Increased tolerance of institutional and programmatic differences, and even contradictions within the educational order, may be called for if a systematic and pervasive consideration of future alternatives is seriously injected into current policy issues and debates.

The futures-perspective, and all of the forecasting, analytic, and valuation work that goes with it, is in itself solely a theoretical exercise unless the political nexus for educational decision-making is prepared to utilize the results of this work. To put it another way, there is a behavioral component to the futures-perspective. We have attempted to locate that component in the behavior of the educational polity, which is

fragmenting under pressures generated at least as much from outside the domain of education as from within it. But an attempt to view the long-term, multi-dimensional future of education may assist in clarifying for the polity, in its fragmented state, what the calculable consequences of different educational goals and programs are. It would help specify the meanings of alternative definitions of the qualities of life which support and which might be sought after through alternative educational arrangements. Viewing the future as a series of alternatives might help reconstitute the polity, but one of its new forms may be a series of polities paralleling a series of alternative modes of education, formal and informal, adult and youth, credentials-oriented and learning-oriented, occupation-oriented and self-fulfillment-oriented.

If and when the educational polity begins to speculate about the future, what will be the short-term climate for acceptance of diversity and social contradiction? Such diversity in modes of education has already begun to emerge. Technology clearly can promote diversity as well as uniformity and monotony. In the field of mass communications, for example, the invention of off-set printing has facilitated the emergence of a sometimes crude, often imaginative group of publications (the underground) which parallels the interlocking official wire services and newspapers. The increasingly cheap, mass production of tape recorders makes possible forms of learning which also run parallel but counter to the formal institutions of schooling. Futuristic designs for information dispersal networks briefly described in the section on The Technological Future clearly afford such opportunities for diversity, although they also provide opportunities for totalitarian uniformity in the content and objectives of an electronic learning age.

The point at issue here is whether different versions of the future held by different groups in the society would result in unreconcilable conflicts about educational goals and strategies. Conflict is not the same as diversity. However, the latter can produce the former under various conditions; e.g., cataclysmic events of a natural or man-made order, increasing or extreme shortage of key resources, institutional rigidity, repressive acts by the constituted authority, violence in support of client demands,

etc. The rebuildings of the educational polity would appear to require, therefore, the utilization of both existing and new mechanisms for conflict resolution.

One of the serious problems in American education today is that various groups, both within and outside the traditional hierarchy of constituted authority (e.g., school and university administrators, teachers unions, student groups, parent organizations) have a hard time listening to each other. They find it difficult to articulate real and significant differences of value, goal, experience, and need amongst them. The futures-perspective, we believe, will tend to "force" greater clarity along all of these lines. But it will create new and magnify already existing problems in the polity of education, which then must be anticipated and mechanisms developed for dealing with them.

B. Problems in Policy-Formulation: When, Where and How to Make Interventions

Given a set of alternative possibilities for future developments in education, the task of policy-formulation is making choices. By accepting the futures-perspective, the policy-making function must rely upon the analysis of futures-history. Little futures-history has been written for education. The techniques, it would seem, are basically similar to the techniques of the historian of the past: the examination of "data" on the basis of which an attempt is made to define sequential relationships among events according to some theory of social causality. In reviewing a set of alternative futures, the policy-making process attempts to identify a particular alternative (a configuration of a set of possibilities) which is more rather than less desirable to see come about. It is the future we would like to invent were it within our capacity to do so. But that alternative is in the future, and policy-making is in the present. Traditionally, the policy-maker is concerned with getting from A to B, with A the present and B a particular desirable future.

The future historian asks the question differently. He posts himself at B, in the future, defined and described as systematically and clearly as possible. First, he has to look back into the figurative "past," some twenty,

thirty, or more years to the actual present, and ask what had to happen between 1969 (if that is "A") and 1990 (if that is "B") such that A, through the infinitely complicated sequence of events we call social change, would lead to B. In the most fundamental sense, planning for the future is the writing of futures-history.

The second task of the futures-historian (or planner) is to identify particular points in the complex sequence of imagined events which he judges to be crucial. Often, they are crisis points, where two or more trends come into serious conflict. Something has to give. It if becomes possible to forecast such crisis points, these then become the points for intervention: for taking action to allow a better chance for a shift toward the desirable future. The futures-historian performs the analysis. But it is in the policy-making function that the responsibility to decide whether or not to intervene is located.

While systematically explicating alternative futures-pictures, specifying educational goals, and analyzing futures-history, we must not neglect to adequately describe the state of affairs in the present. Planners, in and outside of education, always emphasize the need to know where they are starting from. What are the "facts"? What is the reality of the present (which means the more recent past)? What are the critical dimensions of the present we must understand if we are to inject into the futures-perspective an understanding of present trends? These are questions worthy of a great deal of continuing research and investigation. Particularly in the field of education, there is much sound and fury and little hard data, especially in those areas of the complex which have not come under the scrutiny of the officialdom of the system. What we are talking about here is the necessity for developing a more complete and sophisticated set of "social indicators" which tell us what is happening in education which may be critical to speculating about the future.

Consider, for example, different degrees of client satisfaction with educational outputs. What are the facts? Until recently, the official administrative apparatus was not aware of the degree of client dissatisfaction with aspects of the system. This was not considered worth knowing.

Now it is; and so we have an increasing amount of research directed towards the rate, the size, and the meaning of dropping out of school. We need to know a great deal more about a significant number of social behaviors and events if we are to rest more securely in our knowledge of what is happening in the education complex. For example, are institutional consortia in higher education on the increase? What are the number of students participating on Boards of Trustees and in academic senates, and on how many campuses? How many college students live at home, in dormitories, elsewhere; and is there any shift in these figures over the past decade? How many non-professionals are serving in elementary and secondary classrooms as teacher aides? How many bond issues to finance capital construction have been voted on...and adopted or voted down during a significant period of the recent past? How many schools are extending the use of their facilities beyond the normal six- to seven-hour class schedule...and for what purposes? How many schools and universities are using computers to help manage administrative details, such as scheduling of students, teachers, and classrooms, the keeping of records, etc.? What is the number of educational parks in existence? Funded but not constructed? Planned but not yet funded?

A carefully analyzed futures-history ought to indicate areas of behavior and configurations of social forces, both within and outside the educational domain, which will require intensive investigation. Demographic and economic data, of the kind usually used by educational planners, may turn out to be only as critical for effective planning and policy formulation as other kinds of data currently ignored.

The problem of when, where, and how to make interventions is located at the point where the specifics of planning and the definition of goals in the educational polity come together. It represents the point at which educational policy gets translated into action. Goal specification, choosing among alternative goal mixes, delineation of their consequences in alternative futures, the analysis of futures-history, the specification of trade-offs among alternative means-ends strategies: these come into focus when policy decisions are taken to insert specific actions into an extremely complex sequence of events whose dimensions we can only partially know. The

problem of interventions is basic to the policy-making function, irrespective of a futures-perspective. But that perspective exacerbates the problem.

For example, one of the chief problems in policy-making is the need to monitor the effects of the policy (i.e., the interventions) in order to ascertain the degree of their success. The short-term perspective provides a time dimension within which such monitoring is possible. But program evaluation, which is one kind of monitoring, becomes extremely difficult when program outputs are targeted over the ten or twenty-year period, or even longer. The process of feeding in evaluation for a reconsideration of strategy and the selection of new intervention points is a cybernetic loop which becomes lengthened and stretched the longer into the future we cast our net.

This stretching of the time-perspective reduces the capacity of policy to have any significant impact upon the longer-term course of events. The uncertainty quotient is greatly increased. But such an eventuality represents the very antithesis of the idea of policy-formulation and planning, whose purposes are just the opposite; i.e., to increase the impression of certainty and the likelihood of control, at least in the short-run.

The solution to the problem is critical. Yet the art of futures-thinking is still very much at the stage of problem identification. It will require greatly increased inputs of analysis and experience before we are in a position to define solutions. In the short-term, cost-benefit and cost-effectiveness analysis, supported by the tools of operations research, may help; though in the realm of education, even these tools are greatly underemployed. The measurement of effects and the specification of targets, critical to the entire policy-monitoring and program-evaluation process, are difficult enough when applied to qualitative educational goals, even in the present. As we transpose these goals into the longer-term we exacerbate the problem.

Perhaps the most important contribution of Delphi forecasting and the employment of cross-impact matrix is that they "force" the specificity of surmises which might otherwise deal with the future only in terms of generalities; i.e., broad social trends and qualitative definitions. The use of

these methods requires that the participants identify and define the "indicators," the events, and the probabilities of their occurrence in terms clearly understood by every person engaged in the exercise.

Similarly, policies and strategies must be translated into specific, sequential tactics of implementation. This translation moves the policy focus from general futures and general goals (overarching values) to specific futures and specific goals (educational objectives), which are then juxtaposed against present conditions in the education complex. Futures-history describes various paths to move from the present into the future (e.g., the "present" of twenty years hence). Effective long-term planning attempts to outline the crisis points when trends and expectations come into conflict, which represent an extraordinarily complex and interlocking sequence of eventualities. Policy-making then "chooses" which of these paths to follow, and selects the specific points in place and time when interventions might be made. It defines the interventions (specific steps in an overall program strategy) on the basis of their longer-term consequences. But the demand on policy to monitor its effects will require that the interventions be made incrementally. That is, they will be selected on the basis of incremental effects whose impacts are calculated to build gradually over time, rather than causing more gross shifts in educational behaviors. This represents a kind of "hedging of bets" about the future. It requires great flexibility on the part of polity, policy-makers, and planners. For each succeeding year, we are one year closer to a targeted future--which is another way of saying that each year our knowledge of the present and recent past has hopefully increased, and that our conjectures about the future have multiplied as we become more skilled in methodology and interpretation. Thus, we must be ready to shift from one to another path into the future, as trends become more fully understood, and effects evaluated.

It may be argued that this approach makes sense only when the educational polity is in agreement over purposes and goals, or when there is no crisis in education. Crisis, it is argued, requires bold, perhaps revolutionary change. It could be argued, however, that the non-centralized, conflict laden character of the education complex may be just the kind of environment in which a variety of policy choices and innovations become

possible, including a mix of the radical and the incremental. The political problem, of course, is who shall calculate and make the interventions, with what kind of legitimation, and on the basis of what kinds of agreements within the polity. A system which abjures centralized planning and distrusts centralized policy-making is also a system which must rely upon widely dispersed policy strengths: new regional systems, the state departments of education, the thousands of school districts, the private and parochial schools and universities, the burgeoning programs of education outside the formal core of the complex.

One of the graver questions such an approach raises lies in the developing impact and use of educational technology, and the technologies of architecture and school design, of communications and transportation, and of applied bio-medical research. Can technology be applied to increase the likelihood of diversity and multiplicity in education, or will it promote a single future alternative? That is a special case of the more general question about the impact of technology on social life. Generally, the technological futurists believe that technology will solve the social ills of the present (hunger, social deprivation, resource scarcity, and the like). But they tend to slight problems which accrue because of human idiosyncrasy and societal diversity. Technology can be, or could be, a powerful weapon to promote the implementation of a variety of educational alternatives. This possibility may not occur, however, unless we begin to conjecture about the character of these alternatives and decide to what extent they are worth reaching for. The issue is not technology, per se, but for what purposes it may be used.

C. Problems in Planning

There are three areas of problems which come to the fore when considering the implications of the futures-perspective for educational planning. These are: so-called "technical" problems, which pertain to the logic of planning; administrative problems, which raise the question of where within the education complex a capacity for futures-casting ought to be more formally located; and finally, socio-psychological problems, which address themselves to the

question of the states of mind more or less appropriate to the cognitive activity of forecasting and speculation.

There are two technical problems. First, the futures-perspective requires educational planning to deal with exogenous as well as endogenous variables, because questions about the future domain of education require one to look much more carefully and imaginatively at the blurred boundaries between formal and informal educating activities and institutions. Secondly, the futures-perspective starts with the future rather than the present. A series of carefully explicated educational and social futures are taken as given and serve as the basis for the analysis of what we have called futures-history. Futures-history starts with an assumed future (one among many possible futures) and attempts to trace out the number of alternative pathways by which it can be said to have (figuratively) come about.

Given these alternative pathways, the task of planning is to identify, for policy-making, the critical points along these continua where carefully calculated interventions may most effectively mediate between the present and the future. Thus, there is a continuous need for flexibility, for adjudication between new interpretations of our expectations and intentions, new forecasts on future probabilities, and careful evaluation of the effectiveness of interventions so far undertaken. But this evaluation is more than program evaluation, per se. It also requires re-evaluation of the consequences of these interventions as speculations about the future itself change over time.

Futures-planning will possess a cybernetic style, the circularity to which we referred before. The task of planning, then, is to help fit the present to the future by inquiring into the conditions under which the long-term effects of education might possess relevance for the larger future environment. But since these environments (or scenarios) are conjectured and not predictable, we are confronted with the task of valuing them on some preference scale, and then attempting to fit the future to the present definition of a desirable future. Some of the planning techniques which can do this probably exist but have not been put together to form an integrated

set of procedures. Existing instruments, such as simulation-gaming, operations research, systems analysis, Delphi techniques, and the cross-impact matrix may well be essential components of this planning approach. New tools, such as futures-history, will have to be added. For the moment, let us call this kind of activity rolling planning to convey a sense of flexibility, circularity, and wave-like progression. It is distinguished from current attempts at educational planning in America, which tend to select one particular scenario of the future according to the models described in Part II. The selection of a single alternative, in the domain of education, has far-reaching and long-term effects. Consider, for example, investments in school construction, in curriculum change, in teacher training, in capital-intensive instructional technology. The outputs, which consist in part of constellations of skills, knowledge, and attitudes, are explicated over a longer period; the investments take a longer time to be recouped; the pay-offs occur in some future which may be two or more decades hence. What is required is to attempt, by a series of approximations, to come close to the balance point between over-rigidity and inflexibility in educational planning, on the one hand, and extreme flexibility degenerating into chaotic, over-reacting, non-purposive behavior, on the other.

One powerful objective for educational technology and social invention would be to reduce the size of financial, material, institutional and human investments in education so that the longer-term character of the investment is shortened. It may also be necessary to change accounting procedures so that faster write-offs of financial investment can occur. Not the least of what will be required lies in the difficult area of continuous institutional reform and renewal, and in encouraging the creation of new institutions for educating. Finally, the current thesis so much discussed in educational circles of "life-long learning" and "learning how to learn" may represent another way of dealing with these kinds of problems. A great deal more research, conceptual formulation, and experience is needed, however, before we can clearly understand what those terms mean.

The critical administrative issue is where, within the policy/administrative apparatus of educational structures, to locate the functions of futures-casting and the analysis of futures-history. It is unlikely that

futures-casting will be restricted to one or a small group of "research" organizations. There is no legal or political basis for restricting this activity to a select group of government forecasters, for example, even were such a strategem consistent with the values of a free society. A healthy competition and cooperation among futures-casting organizations will probably much better reflect diversities of intentions and expectations. It is becoming clear, however, that the development of a surmising forum as de Jouvenel called it, requires a certain degree of sophistication in the use of new techniques for systematic speculation and projection. This would, in turn, imply the necessity for a resource-investment beyond the capacity of many of the subunits and subsystems of the education complex.

The problem, actually, has two aspects--we shall need futures-casting about the general societal environment, including therefore technological developments and impacts, and futures-casting about education. While the two are integrally related, as we have attempted to demonstrate, nevertheless the former requires a broad-band focus, while the latter concentrates on narrower areas. Moreover, one might anticipate that the explication of alternative social and technological scenarios, and the writing of general futures-history, will be useful for all domains of human activity. There is scarcely an institutional order, together with all of their organizations, whose policy and planning activities might not be informed and illuminated by the futures-perspective. We see no reason why this general function, then, should be limited to and located only in the educational domain. The development of surmising forums may be forecast for any sector or institutional order where longer-term consequences of present actions are of interest, and which have the resources to finance a group of professionals to develop methodological techniques for the gathering and analysis of "data" on the future.

We would anticipate the creation of organizations operating either for profit or supported by public or philanthropic funds whose special focus is the broader dimension of the future. Similarly, we might expect the birth of more than the presently existing two policy research institutes which possess a special focus on educational futures. The Educational Policy Research Center at Syracuse and the Educational Policy Research Center at Stanford, both supported by the United States Office of Education, have a

broad mission to consider the general domain of education in the futures-perspective. The problem which emerges is the necessity to extend throughout the complex a capability and interest to engage in futures-casting for education, to analyze futures-history, and to utilize the fruits of such work at the subsystem and subunit level. If, over the longer-term, this extension does not occur, then it will hinder the development of regional, subregional, and local diversity within educational innovation and experimentation.

What we do not yet know is the extent to which it will make sense to attempt regional futures-casting. What are the variables within a geographic region, a single state, a metropolitan area which might give to their possible futures a special flavor within the larger society? Some of the work of the Eight-State Project suggests that both economic, demographic, and metropolitan growth forecasts might well differ from one region of the country to another. Will goals, intentions, and qualities of life also differ? The question of the span of futures-casting is related to administrative/political questions of span of control. A major objective of present organizations in the field is to disseminate as widely as possible a general familiarity with the futures-perspective and competence in the techniques.

From the more formal administrative viewpoint, the futures-perspective capability should be protected from demands for particular "forecasts" made by the policy apparatus in the parent organization or subsystem. The dangers of self-fulfilling prophecy in the art of futures-casting are obvious, though not yet sufficiently understood to identify the extent to which a particular set of forecasts will influence policy. Still, intention is the mother of expectation. Research is now underway to attempt to develop ways of handling this particular problem. Nor should we forget that the systematic articulation of intentions, as well as expectations, is a critical aspect of futures-casting. This is particularly true in education because of the necessity to explicate and define the goals and values which prevail and which may come into existence given changes in technology, culture, and symbolic behavior.

Thus, two operational caveats might be suggested. The first is the desirability of protecting the futures-casters, as an administrative entity,

from ideological and policy demands subtly or clearly imposed upon them by their administrative superiors, or by those organizations who finance such an enterprise.

Second, and more important, is the desirability--indeed, the necessity--of making available to the general public the products of futures-casting, i.e., the alternative educational scenarios, the futures-history analysis, and the policy analysis which follows. Included in this rule is the recognition that along with the material itself must go a straight-forward account of the philosophy of the futures-perspective. This task of dissemination and translation may not be easy to accomplish, but to restrict it because of presumed problems in its interpretation and employment would be to negate fundamental values of the society.

We have already suggested (Part I, Section B) that the futures-perspective raises the overriding question of how human beings and organizations may most effectively deal with ambiguity and uncertainty. We must now consider, from the psychological viewpoint, the question of what kind of human behavior is involved in the forecasting and futures-casting activity.[43] Is it, for example, different from cognitive behavior which deals with the present? Weaver suggests that, "Perhaps the major distinction between future cognition and thinking about the present or past is the degree to which judgment can be based on data-supported inferences. Future cognition limits data-supported inference because of the uncertainty and unknowable nature of the future."[44]

The role of the professional engaged in any kind of forecasting behavior raises the question of whether a focus on the future requires some particular cognitive styles and belief sets which may not be evenly distributed within a given population--even among a group of planners and other experts who may become involved in the forecasting activity. If it will be possible to isolate and define these styles, then we will have to confront the questions of recruiting, selecting, and training for the special set of activities involved in planning for a longer-term, multi-dimensional future.

Weaver's research suggests that in two aspects of thinking about the future (i.e., projection beyond the immediacy of observable reality and generating alternatives) there are differences among individuals. He has developed a model based upon the cognitive behaviors of a) projection, b) foreseeing alternatives, and c) drawing conclusions in the absence of facts (which is defined as one's tolerance for acting under highly ambiguous and uncertain conditions) which "appear to be relevant to the entire tradition of research dealing with open and closed mindedness."[45] [emphasis ours] Weaver's conceptual model leads to the assertion that closed-mindedness--defined as the integratively simple, concrete style--as typically distinguished from open-mindedness--defined as abstract, integratively complex--disposes towards a more rigid cognitive style. In other words, such persons develop "fewer future alternatives and fewer insights into relationships among alternatives and effects; more narrow ranges of dates assigned in forecasting occurrences of alternative future events."[46] The empirical research conducted to test these assertions suggests that the fullest elaboration of the futures-perspective will require the utilization of persons who are characterized as open-minded, who can deal comfortably with ambiguity and uncertainty, who can generate their own "data" about the future beyond empirically based knowledge, and who can create, through conjecture, a larger number of alternative scenarios. This research also raises tough questions about the interpretation of results obtained from the Delphi technique, which is generally employed to develop consensus among a group of persons engaged in forecasting dates and probabilities of occurrence of specific sets of events.[47]

From the practical viewpoint, this initial research leads us directly into the difficult question of what kinds of persons, in socio-psychological terms, may be better equipped to perform the kinds of activities we have described in earlier sections. It presses strongly for further research to identify the kinds of personality types which can more effectively engage in futures-casting, in the analysis of futures-history, and in rolling planning.

Certain administrative questions are suggested. Will it be necessary, and possible, to reorganize the administration of planning in order to more clearly distinguish among certain kinds of activities and in order to recruit, select, and/or train different kinds of people to perform these different activities? In terms of role-differentiation, will it be useful to distinguish among the following: 1) the day-to-day implementer of educational change, 2) the short-term planner of complex sequences of minute interventions, 3) the "objective" evaluator of the consequences and effectiveness of short-term planning and implementations--these might be considered one major category of administrative functions and roles--and 4) the open-minded, relaxed, imaginative planning and policy analyst who can deal comfortably with uncertainty, ambiguity, the long-term conjecture, and the proliferation of alternative future possibilities?

We recognize the naivete of these questions, both from the viewpoint of their definitional vagueness and from the viewpoint of assuming a degree of rationality and control in the administrative and personnel processes of the education complex. On the other hand, continuing empirical research and conceptual formulation along these lines may begin to suggest new and alternative models for the selection and training of administrators and planners who might begin to apply the futures-perspective to policy, planning, and implementation functions in the domain of education and in the dynamics of educational change.

POSTSCRIPT

(Notes on Using the Futures-Perspective in Educating for the Future)

One is inevitably confronted with the reality of futures-thinking. The question lies at a more profound level of inquiry than operational questions. What is futures-thinking; what does it do for us, as human beings? The question is of the same order, and perhaps susceptible to the same kind of analysis, as the question: for what human purposes is education to be understood? Indeed, the exploration of the significance of the futures-perspective for educational activity (or for the activity in any domain of organized human conduct) may well serve as a powerful way of getting at the fundamental questions of the meaning and purpose of education.

Throughout this paper, we have used the terminology of the futures-perspective as if the words stood for a reality "out there" in the future. That is the shorthand which the written language of communications impels us to use. But indeed, such phrases as "alternative futures" represent a mental construct, a metaphorical way of saying something in shorthand which, on further analysis, has no existential reality. When the "future" possesses an empirical base, when its content has the hard reality of social events and individual actions, when it is factual, we will have moved in time. The future has become the present, which is itself a fleeting moment of impressions which we can analyze and come to know only as the past, whether of a moment or a century.

This might suggest that the reason for engaging in essentially a metaphorical activity (however systematic and analytic may be our methods for so doing) lies very much in the present. By engaging in futures-thinking, we are, in reality, formulating new and perhaps more effective ways to deal with the ever-present questions and behaviors of human judgment and choice. Were we to know the future; were the future to be determined by the previous course of history which, were our knowledge of the past complete enough, we might predict: in such a case, the reason for our wanting to know and predict could only lie in our possible wish to change that future, to alter

the course of human events. But that desire to change the future inevitably raises the question, change it to what? And upon further elaboration of the argument, we would soon reach the point of asking what are the bases, socio-psychological and moral, which place us in the position of finding one rather than another state of affairs more desirable, more attractive, more praise-worthy.

In other words, the futures-perspective may serve to better inform and illuminate the content and the skill of practical judgment, whereby we attempt to choose among a host of alternative possibilities, many humdrum and unimportant, but some of more profound consequence. The art of practical judgment, of making sound and effective choices whose consequences we are prepared to accept, requires us to attempt to understand, through conjecture, what these consequences might turn out to be. Such consequences of human action and choice lie in the future--that is to say, in what we imagine, intend, and expect the future to be when it has become the present.

The implications of this analysis for education are important and untested. We can only surmise that the escalating rapidity of change along all fronts challenges the theory that the institutions of education and the process of learning are now best rationalized by the need for anticipating socialization in human society by which the newborn are formed into acceptable, participating members of adult society. The argument does not rest on a challenge to the thesis that education is a special form of socialization, even in modern, complex societies. It states that no longer is such a thesis sufficient. It states that change requires choice; that choice assumes alternatives to choose among; and that alternatives emerge because of the diversity of our expectations about what the future will be like, and of our intentions of what the future should be like.

It may be that the futures-perspective should be incorporated into educational curricula; that an effective way to teach and learn would be to ask questions about the future as well as about the past. There is some small, but nevertheless suggestive experience emerging in the employment of simulation-games on the future for college students that tough analytic skills and learning motivation are substantially increased. One might ask

whether the purpose of education in this day and age is to know, which means to extract from the past our knowledge of it and transmit that knowledge to others, or to choose, which means employing ways to enhance the capacity to exercise critical judgment? Such ways would, of course, include what we can learn from the past which may assist us to deal with the future. But the question suggests more; namely, that we ask of ourselves not only where we came from, but also where we are going. An acceptance of that question leads to the recognition that the futures-perspective, utilizing existing tools of projection and of speculation, and developing new tools, ought to receive serious consideration as a significant addition to what throughout most of the world is generally called education.

FOOTNOTES

1. An expression of appreciation must go to a number of persons who have reviewed and commented critically on this paper in draft form. Particular thanks are due to Dr. Thomas F. Green, Director of the Educational Policy Research Center at Syracuse and Professor of Education, Syracuse University, and to Professor James E. McClellan of Temple University, a member of the Center's Research Development Panel, for their thorough analysis of the underlying argument of the paper and cogent suggestions for revision. In addition, Professor Robert Wolfson of the Maxwell School of Citizenship and Public Affairs, Syracuse University and Associate Director of the Center, together with other members of the Center's staff, undertook a thorough review of the draft and offered useful suggestions for revision.

   Mr. Michael Marien, Research Associate at the Center, participated fully in the analysis out of which the paper emerged. His own research on the Education Complex forms a basic foundation for the review of educating systems in terms of the futures-perspective criteria.

   It would have been most difficult to conceive and write this paper except within the general framework and approach of the Educational Policy Research Center at Syracuse. The fundamental ideas of the paper receive continuous analysis, revision, and research application as a basic objective of the Center. Nevertheless, the judgments asserted and conclusions reached in this paper are the responsibility of its senior author. The paper does not represent official policy of the Center, nor of any of its sponsors.

2. Two bibliographies have been compiled at the EPRC. One, by Michael Marien, is a partially annotated bibliography of the literature on educational futures. Much of this literature, however, is not research in the strict sense. Another, by Dr. W. Timothy Weaver is a bibliography on social-psychological research dealing with the question of the behavior involved in futures-thinking: what people do, from the viewpoint of cognitive styles and belief sets, when they engage in thinking about the future.

3. Bertrand de Jouvenel, The Art of Conjecture, Basic Books, Inc., New York, 1967.

4. Ibid., p. 10.

5. Education in the Seventies, a series of planning papers prepared by the Office of Program Planning and Evaluation, U.S. Office of Education, Washington, D.C.: U.S. Government Printing Office, May 1968.

6. Paul Alper, "A Critical Appraisal of the Application of Systems Analysis to Educational Planning Models," IEEE Transactions on Education, Vol. E-11, No. 2, June 1968.

7. The Digest of Educational Statistics, National Center for Educational Statistics, U.S. Office of Education, Government Printing Office, Washington, D.C., November 1968, p. 2, Table 1: The Fall 1968 enrollment figures, kindergarten through grade 12, public and non-public, were estimated at 50,900,000 students.

8. This is not to denigrate visionary versions of the future. Indeed, one powerful mind, through its own internal and complex mental processes, may well generate such visions, whether of a projective, prescriptive, apocalyptic or utopian variety. This is termed "genius forecasting." We only mean that for policy analysis and planning (hence, "operational" purposes) we ask questions about the plausibility of the vision, and thus subject it to systematic analysis utilizing the most effective instruments available.

9. The Delphi technique is discussed more fully by its author in N. Dalkey and O. Helmer, "An Experimental Application of the Delphi Method to the Use of Experts." Management Sciences, 9, 1963.

10. T.J. Gordon and H. Hayward, "Initial Experiments with the Cross-Impact Matrix Method of Forecasting," Futures, Vol. 1, No. 2, December 1968.

11. We recognize the philosophic issues which underlie this argument. Suffice it to say, for the purposes of this paper, that some notion of the possibility of human control of, or at least impact upon, its future is implicit in any attempt to deal with the uncertainties which lie before us. Moreover, some assumption would appear to underlie the entire field of planning which represents, whatever its present degree of effectiveness, an active, as distinquished from a purely reactive, approach to human purpose and social events.

12. This analysis of education as a "complex" draws heavily upon the work of Michael Marien, a Research Associate with the Educational Policy Research Center, who has been engaged for the past two years in developing an overview of American education which facilitates a systematic analysis of its major characteristics as they might impact upon, indeed serve as the limits for, its future development. Michael Marien, "Notes On the Education Complex as an Emerging Macro-System," an EPRC Working Draft, April 1969.

13. Initial data was first presented in Annals, September 1967. It will receive more exhaustive treatment in: Wilbur J. Cohen, Bertram M. Gross, and Stanley Moses, The Learning Force, to be published by Basic Books, Inc., in 1970. Members of the Educational Policy Research Center staff, including Mr. Moses, are currently engaged in formulating alternative scenarios for post-secondary education in the future in order to provide a framework for policy analysis.

14. Digest of Educational Statistics, op. cit., p. 6, Table 7. These figures are estimated. Note that these statistics exclude the 50 state departments of education (or educational agencies) where a more comprehensive overview and responsibility for educational planning is, in theory, located.

15. The Third Annual Report of the Advisory Council on State Departments of Education, "Focus on the Future Education in the States," Office of Education, U. S. Department of Health, Education, and Welfare, U. S. Government Printing Office, Washington, D.C., March 1968. The Advisory Council was authorized by the U. S. Congress under Title V of the Elementary and Secondary Education Act of 1965, Public Law 89-10, and reports annually to the President of the United States and both Houses of Congress on the administration by the 50 state departments of education of funds provided under Title V whose purpose was to strengthen State Departments of Education, particularly in their leadership role as planning agencies for public education carried on within each state.

16. Education in the Seventies, op. cit., p. 28.

17. Ibid., p. 34, Table 23.

18. Ibid., p. 44, Table 29.

19. Harvey J. Hartley, Educational Planning-Programming-Budgeting: A Systems Approach, Prentice-Hall, 1968, p. 238.

20. Herbert S. Parnes, "Assessing the Educational Needs of a Nation," in Educational Planning, ed. by Don Adams (Syracuse University Press, 1964), pp. 51-52.

21. Learning to Learn-Highlights: Tri-School, Washington, D.C., National Laboratory for the Advancement of Education Conference, November 18-20, 1968, Washington, D.C.

22. Charles E. Silberman, "Technology is Knocking at the Schoolhouse Door," Fortune, August 1966, Time, Inc.

23. Herman Kahn and Anthony J. Wiener, The Year 2000: A Framework for Speculation on the Next Thirty-Three Years, The Macmillan Company, U.S.A., 1967, p. 93.

24. W. Timothy Weaver, "Individualizing Instruction: Toward Some Principles and Consequences," Educational Policy Research Center at Syracuse, Working Draft, June 1968.

25. Kahn and Wiener, op. cit., pp. 166-167.

26. New Schools for New Towns, School of Architecture, Rice University, a project sponsored by Educational Facilities Laboratories, Inc.

27. Ibid., p. 4.

28. Designed by architect Charles Colbert to supplement teaching in a new town, Ibid., p. 14.

29. Proposed by educators John Tirrell and Albert Canfield, Ibid., p. 16.

30. Designed by architect Cedric Price for a decentralized education system based on the Tirrell-Canfield program, Ibid., p. 24.

31. The States are Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

32. Advisory Committee on Intergovernmental Relations, Urban and Rural America: Policies for Future Growth, Washington, D.C.: U.S. Government Printing Office, April 1968, pp. 63-64.

33. Ibid., Chapter IV, "New Communities in America and Their Objectives."

34. From interviews with Dr. Leo Molinaro, President of the American City Corporation, Columbia, Maryland, and members of his staff and from a site visit.

35. Mario D. Fantini, Milton A. Young, and Frieda Douglas, A Design for a New and Relevant System of Education for Fort Lincoln New Town, August 15, 1968, submitted to the Superintendent of Schools, District of Columbia, and the National Capitol Planning Commission, District of Columbia Redevelopment Agency, Washington, D.C.

36. Ibid., p. 10, emphasis ours.

37. Report of the Advisory Committee on School Goals to the Board of Education, Westport, Connecticut, February 1969.

38. Ibid., p. 1.

39. Ibid., p. 2.

40. These remarks on the educational policy are restricted to the American scene. That restriction is of paramount importance. Other countries may not only possess a more centralized apparatus for policy-making and planning; they may also possess a much less disaggregated educational policy than in the United States. These two situations raise different sets of questions. A country, for example, which has recently embarked upon the new development of a public education system will probably possess a remarkably circumscribed polity for its new educational program, though as that program expands, and indeed, perhaps as a measure of its success, the policy may also expand and set its own limits and assign its own significance to the goals, the inputs, and the outputs of the burgeoning system. One might indeed anticipate a heightened sense of educational crisis in a country among an increasing portion of the population just to the extent to which a larger portion of the population becomes drawn into the system, as students (both adult and youth), and as suppliers, or, most importantly, as potential beneficiaries whose educational aspirations outrun available educational resources.

41. Fragmentation in the policy has happened more than once in history; for example, when the immigration of foreigners to American shores reached so substantial a portion of the populace concentrated in major urban centers, grave questions arose as to the social and human purposes for which education was to be understood, as to the effectiveness

of then-existing educating institutions and programs to achieve these purposes, and as to the propriety or legitimacy of various new or non-traditional suppliers, users and beneficiaries participating in the policy-formulation process out of which would emerge answers to these questions. See Lawrence Cremin, The Transformation of the School, New York: Alfred A. Knopf, 1961, pp. 66-75.

42. James E. McClellan, Towards an Effective Critique of American Education, Lippincott, Philadelphia, Pa., 1968.

43. The following discussion draws heavily on the work of W. Timothy Weaver, Research Fellow at the Educational Policy Research Center. He undertook a major study, concluding in the submission of a Doctoral Dissertation in May 1969, which attempted to provide a conceptual and empirical basis for defining and predicting different types of forecasting behavior. Forecasting and Forecasters - What is Expertise? EPRC Working Draft, April 1969.

44. Weaver, Ibid., p. 5.

45. Weaver, Ibid., p. 7.

46. Weaver, Ibid., p. 10. Integratively simple persons tend to be more narrow than complex persons on future estimation tasks in the presence of cues (e.g., forecasting data generated by other people). However, in the absence of cues, simpler persons become quite inconsistent, while more complex persons change their behavior very little.

47. Of the basic assumptions of Delphi, two seem to be particularly in need of rigorous testing. First, the assumption that consensus means plausibility for group conjectures is, on the surface, contrary to accepted use of scientific judgment. Judgment is normally deemed plausible when estimating, ranking, rating, etc., are done independently but still produce consistent results. Delphi forces consensus-seeking behavior. The question is, what kinds of people are influenced by consensus-forcing conditions, and how do their responses affect overall results? Second, Delphi principles place heavy emphasis on "cool analysis" by the expert; i.e., logic and fairness of choice with minimal influence of the desirability of the future event in question. Weaver's research suggests that the abstract person (presumably the "expert") is more likely to let desirability influence estimates of occurrence of future events than concrete persons. W. Timothy Weaver, Forecasting Events Relevant to Education: Some Effects of Conceptual Level on Estimating and Predicting, Doctoral Dissertation, Syracuse University, 1969.

APPENDIX A

Critique of: "An Approach to the
Futures-Perspective in American Education"

by

James McClellan

Mr. Ziegler's paper raises so many questions that the critic is at a loss where to begin. Although it wouldn't ordinarily be taken that way, the sentence just above was intended as a tribute to Mr. Ziegler's paper, hereinafter called PZ. For PZ does raise almost all the questions which one encounters as he tries to think systematically and purposefully about the future. Note the three adverbs: I say "almost" just to hedge; I can see no significant question not at least mentioned in PZ. I say "systematically" to point out both a quality of the thinking and the object to which the thinking is addressed. Thinking is systematic as it is ordered, sequential, cumulative; one step leads to another, one finishes at a point beyond where one began. To think that way about the System of American education in the future is to blaze a new trail. I say "purposefully" because in PZ systematic thinking about the System has a goal other than thought itself: it is to provide a vision of the present such that we may choose to make the future different from what it would have been without thought-directed action. To provide an intelligible survey of the questions that must be answered in such an enterprise is an achievement. To do so in a pleasingly literate sixty pages elevates the achievement by some order of magnitude.

But the task of the critic is not well performed merely by extending praise. I believe that PZ adopts a very wrong answer to the central epistemological questions that it faces. I believe that the wrong answers to those epistemological questions subtly conduce to some wrong attitudes exhibited by PZ toward more urgent political and ideological questions. I believe that I can make a very strong case for the first point, and I can provide an argument that some may find convincing on the second point.

I

The Epistemology of the Future

Often when someone asks something about a future event, it is reasonable to ask: "How do you know?" Frequently the question will bring a disclaimer: "I don't really know that a military coup d'etat will occur during Nixon's administration. It's just something I suspect because of the prevalence of such take-overs in other nations." So let us begin with the second problem, i.e. how to distinguish the various modes in which we discourse about the future: "I expect that X will happen. I suspect that X... I doubt that X... Etc." Any one of these modes will admit certain significant values for X, and some of them will exclude certain values for X. Thus if X be: "Every one of the three trillion people on the planet Earth will be ecstatically happy from awakening to retiring during the day of 23 June, 1989," then one might not significantly be said to expect X though he might significantly, albeit stupidly, say "I pray that X."

Modes of discourses about the future vary not only in the certainty of expectation of future events but also in attitude ("emotion") toward those events.[1] And the language itself very carefully separates these two dimensions, i.e. certainty vs. uncertainty, positive vs. negative attitude. Consider S: "I am glad that the general strike will take place tomorrow." That statement both presupposes that the speaker knows the event will occur and asserts his positive attitude toward that event. It is a perfectly natural retort to S to ask "How do you know?" The retort can come just as well from a person who knows perfectly well that it will but doubts that (or is curious as to how) the speaker of S knows that it will occur.

Now suppose the speaker of S cannot sustain his presupposition of knowledge. (At the moment we need not go into detail as to just what knowledge-criteria apply to statements like S; that topic arises below.) If he says "I don't really know that the general strike will occur tomorrow," he must retract S, replacing it by, say, S': "I hope that..." or S": "I should be overwhelmed with joy if..." Etc.

In the light of these very obvious considerations, how are we to understand the first sentence in the text of PZ: "We cannot know the future."? If that sentence in PZ means that we cannot know any proposition describing an event having a space-time designation later than the space-time designation for the assertion of the proposition, then it is simply false. I know that the sun will still be above the horizon an hour later than the time I am writing this sentence (7:42 AM). At that time most of the inhabitants of Philadelphia will speak English (or rather what passes for English in Philadelphia). Etc.

So that first sentence in PZ is simply false if it be taken to deny that any future-describing sentence can be known. Suppose, however, it means that we cannot know <u>all</u> propositions which describe the future. Then it is true but trivial, for we cannot know <u>all</u> propositions descriptive of the present and past. As I am writing this sentence, it is either true or false that a Sr. Carlos Castillo Amarzo is arising from his bed in Tegucigalpa, but I do not know which. One can date Sr. Castillo's arising a day earlier or a day later. <u>That</u> difference is irrelevant; my ignorance as to the truth or falsity of the sentence is unaffected by the change of date. One could just as well begin PZ by saying "We cannot know the present" or "We cannot know the past."

These objections to the first sentence of PZ are themselves trivial, but it is necessary to get obvious errors out of the way so as to get on to more serious matters. The fact is that the epistemology of PZ is derived from de Jouvenel's <u>Art of Conjecture</u>, and in that classical work we find a serious philosophical error. The first sentence of PZ is repeated many times and in many guises in de Jouvenel. Thus (p. 5):

> It seems, then, that the expression 'knowledge of the future' is a contradiction in terms. Strictly speaking, only <u>facta</u> can be known; we can have positive knowledge only of the past. Or (p. 4):
>
> Now let us suppose that I say: 'I will go to Australia.'... my presence in Australia is not a <u>factum</u>, and so the question of the truth or falsity of [my] statement...does not arise.

Notice first off that de Jouvenel's way of talking does not accord with ordinary language. Suppose I am a colleague of de Jouvenel's. Hearing a rumor, I check with still a third colleague: "Is it true that de Jouvenel will go to Australia?" I.e. the question of truth or falsity does arise.

Nor is my question necessarily a question about de Jouvenel's intention. (Art of Conjecture, p. 4: "As a statement of intention it can be [true or false], but it cannot as a statement of fact.") The third colleague to whom I address my question might well reply "Bertrand fully intends to go to Australia, but in fact the Inspector has plans which will prevent his departure." The question does arise as a question of fact; at least it does or can arise in ordinary language.

Why does de Jouvenel talk this way? Why does he say things that obviously contradict our usual ways of talking about the future? Let me suggest an answer which, even if it isn't de Jouvenel's reason, throws some light on PZ. Let us consider the first sentence of PZ again: "We cannot know the future." Just what does "know" mean here? To be personally acquainted with? To experience (or have experienced) directly? Now obviously none of these answers is in any way relevant to the major arguments in de Jouvenel or in PZ. To know the future in this context means to know that so-and-so will occur at some future date. But we seem to know that many things will occur in the future, e.g. that the sun will rise tomorrow. The suspicion then arises: PZ and de Jouvenel are speaking from a particular epistemological position or theory which precludes anyone's ever knowing that p, where p bears a future date. What might that epistemological position be?

Let us begin with the standard analysis. To say that A (a person) knows that p (a proposition) implies the following

(i) A believes that p.
(ii) A has adequate grounds for believing that p.
(iii) p (is true).

Surely there is nothing about (i) or (ii) which in any significant way distinguishes the p's bearing some future date from the p's bearing present

or past time-subscripts. You, I, everyone believes that certain events will occur; often we have quite conclusive reasons for our beliefs. There is nothing in (i) or (ii) to justify the first sentence of PZ. Nor is there in the body of PZ or in The Art of Conjecture any distinctive argument on what it is to be a belief or adequate grounds for belief to lead one to think that Ziegler and de Jouvenel hold a distinctive view on (i) or (ii) which would account for their departure from common sense in claiming that we cannot know the future.

The hang-up is (iii), quite clearly. And the reason that (iii) leads Ziegler and de Jouvenel to say that no future-dated p can be known is that both adopt a rather crude version of the correspondence theory of truth. That theory of truth holds that a proposition is true if and only if it corresponds to a fact. Since there is no factum (past participle) for a statement about the futurum to correspond to, no statement about the future can be true (or false either, for that matter); hence no statement about the future can be known.

Now this interpretation of Ziegler and de Jouvenel has the obvious merit of explaining why they hold, in the face of obvious, common-sense objections, that we cannot know the future. But do they hold that view for that reason? Ziegler doesn't have the time and space to develop his epistemology, and he seems to follow de Jouvenel. The latter never picks up these questions explicitly; but scattered throughout The Art of Conjecture one finds many suggestions to sustain the interpretation I have given. Just to give one example. In a very original discussion of the "ecology" of ideas, de Jouvenel interrupts himself:

> 'But,' the reader objects, 'it is improper to treat ideas which are not even "concrete objects" as though they were plants and animals.' To this my reply is as follows: 'Any intellectual representation of a reality is fundamentally and necessarily inadequate, but it is essential for us to "represent" things in order to speak about them. The more concrete the representation is made, the easier it becomes to speak about them.' (p. 255)

The ideal proposition, then, would be one in which there was a one-to-one correspondence between the ("concrete") representation of some fact and that fact itself. As I said, the correspondence theory of truth is treated very crudely by de Jouvenel. I would also assert, if pressed on the matter, that no correspondence theory of truth, however sophisticated in its formulation, can ever account adequately for what we mean by (iii) above.[2] In Section II below, I argue that PZ's vague acceptance of the correspondence theory of truth leads to certain errors of strategy in treating future events. But I wish to conclude this section with a statement of certain consequences of giving up the correspondence of truth. Suppose I say that I know the sun will rise tomorrow. (We can even imagine a situation in which that statement would be significant. Suppose a man had been born and lived his first twenty years in a dungeon: he had never seen nor understood the concept of a sunrise, but, living in a dungeon with certain social as well as physical regularities, he had learned to use the words 'believe,' 'know,' 'hope,' etc. as they are ordinarily used in English. I rescue him from the dungeon, and he spends his first day of freedom delighting in sunshine, showers, birdsong, etc. As evening comes on he says that he hopes that the sun will rise, that showers will fall, and that birds will sing tomorrow. I can assure him that I know the sun will rise, and can join him in hoping for showers and birdsong. On the hypothesis given, he would understand the difference.)

Now what may seem an odd thing happens when we give up the correspondence theory of truth; it is this: when we claim to know that certain future events will occur, our present claim to know can be falsified by future events. Contrary to all our present cosmological theory, the solar system might simply explode overnight or undergo a total reversal of magnetic and gravitational fields, or do any number of describable, hence conceivable, things. If any one of those unlikely things occurred and left me with sufficient consciousness to consider the case, I might say: "Yes, I thought I knew that the sun would rise today, but since it didn't rise, then I didn't know that it would." Or I might simply believe I was dreaming and try to live in that strange new world as a somnabulist. One cannot say what he expects will happen if the totally unexpected happens.

But what seems an odd thing actually brings our knowledge of the future into line with our knowledge of the past. Our claim to know that Caesar crossed the Rubicon in 44 B.C. depends upon two things: (α) vestigia, extant and warranted, and (β) a conceptual scherae in which to interpret those vestigia. If the future revealed new vestigia which, given (β), caused us to change our minds about Caesar's actions; or if we found so many discrepancies in (β) when applied to other events that we decided to abondon (β) and adopt (β') which, taken with (α), caused us, say, to regard the year 44 B.C. as the wrong date, or if both of these should occur, we might have to say in the future that our present claim to know the past was false.

In sum, when one adopts the correspondence theory of truth, along with that theory's presupposition of a metaphysical distinction between "fact" and "representation of fact," one is led to say that we cannot know the future. There is good evidence that de Jouvenel holds to the correspondence theory of truth. There is evidence that Ziegler follows him in this regard. This is a very "present" thing: PZ and The Art of Conjecture lie side by side on my table. But I am careful not to say that I know that de Jouvenel holds to that theory and that Ziegler follows him for that reason. And my care not to claim to know is precisely the same that any responsible person exercises when he talks about past or future events: the evidence and the scheme for interpreting the evidence simply aren't that clear. When they are, our claims to know that p are warranted, whether p bears a date past, present, or future. Any other view of the epistemology of the future involves one in metaphysical muddles which we cannot stop to clear up here.

II

Epistemology and the Strategy of Future-Study

The trouble about knowing the future in a way relevant to educational planning is both like and unlike knowing the pre-Columbian history of Mexico: It is like in that the data are scarce and often, given our accepted cate-

gories of interpretation, ambiguous. It is unlike in that we believe that patient, careful, and continuous search for new evidence and rigorous re-examination of our categories of interpretation will eventually yield us as accurate a picture of pre-Columbian Mexico as it is possible to get; but we do not believe that the continued application of traditional academic techniques of research will yield us an accurate picture of the future on which to build our educational policies. Why not? Well, we believe that somehow the history of pre-Columbian Mexico is there to be known, while the future of American society is to be made; the future depends on what we choose to do with our educational program as much as it determines what we ought to do. That <u>feeling</u> of a difference between what is over-and-done-with (as we say) and what is yet-to-be is genuine, and it is not less significant just because it is not adequately accounted for by the correspondence theory of truth, as discussed above.

What is not so clear is just what difference it makes for scholarship and research that we focus on the future rather than the past. Just to understand the logic of the case, let us suppose that in studying pre-Columbian history we make use of two general principles:

A. In marginal climates, like that of the American Southwest, outward migration is a function of deprivation of rainfall.

B. The width of annual tree rings is a function of rainfall.

With these two functions and with some remains from trees that grew during the pre-Columbian era we should be able to make fairly accurate estimates of population migrations during that period. At its very simplest, that use of functions gives us an explication of the somewhat esoteric terms 'endogenous' and 'exogenous' as they appear in PZ. The pair of functions, A and B, contain three variables--rainfall, migration, and width of growth rings. To the last we can affix a time scale because of the purely happenstance phenomenon that some trees grow by annual layers.

Let us now re-state this argument in a more rigorous form:

If (B') it is a necessary and sufficient condition for the ring of year N to be larger than the ring of year M that more rainfall fell in N than in M;

And if (A') it is a sufficient condition for greater migration in year M than in year N that there be more rainfall in N;

And if (Instantiating condition) we know that the ring corresponding to year N is wider than that of year M,

Then (Conclusion) we can deduce that migration in M was greater than in N.

(In fact, of course, all those assumptions are false when stated so precisely, but the principle still applies when they are formulated in the way archaeological historians actually use them.)

Now relative to the system of functions specified in A' and B', all other variables are exogenous. Notice the difference between A' and B': the first states only a sufficient condition, the latter a necessary and sufficient condition. Put in the other terms, B' states that there are no exogenous variables relative to the growth of trees. That rather large claim may never be amply justified but surely we know what it means.

But what about A'? We can understand a climatic variation being a sufficient condition for a Volkerwanderung, but we cannot understand it as a necessary condition. For people might just decide to leave where they are and go elsewhere. And deciding to go is not a separate event which could be counted as another sufficient condition, which, taken with the other sufficient conditions gives us a basis for saying that the necessary condition is any one of the finite list of sufficient conditions. Rather, deciding to go is more like a particular way of going, i.e., with decision, deliberately, by choice, albeit the lesser among evils. But notice: our functions enable us to explain the past event even though we are not able to state the necessary conditions for its occurrence. There may be all sorts of exogenous variables operating in the event of an outward migration

of people from a desiccating area. They may move with speed and clear direction; they may drift indecisively. But if our functional generalizations are true, and the instantiating condition as stated (a datable tree with varying-sized growth rings), then they move. That's all. I take it that, pace you believer in the verification principle, that such functional generalizations may be true (even though the simple examples treated here are false) and that they can be known. I cannot imagine history's being very enlightening if it restricted itself to such explanations of social behavior, but I cannot see, in principle, why such explanations are not possible and, taken with moderation, desirable in historical accounts.

Nor, in principle can I see why precisely the same form of argument does apply to future events as well as to the past. It's a matter of happenstance that we can distinguish rainy years from dry years by tree trunks. It might be equally possible that we could predict rainy years by knowing the cycle of sunspots. If A' is true, then we could as well predict outward migration from marginal climates as "retrodict" it. But that is "in principle." In practice we simply cannot imagine an A' which would be both precise and true as a statement of a sufficient condition for something as socially significant as movement of people from one geographical area to another. We might make the outcome different. And now "exogenous" means something different from what it meant before. In the historical case, we took it as possible and understandable for A' to be true. Then exogenous variables are those which affect the quality of the event, not its happening. The people moved; exogenous variables determined only how, perhaps where. But in the future case, we cannot consider it possible and understandable for A' simply to be true. We soften it; we say it's a tendency; we say that ceteris paribus (which, as PZ recognizes, gives the whole game away) A' is true. We can simply imagine too many things that people might do besides moving from their accustomed homes even if there were a predictable dry spell. So now, i.e., when speaking of the future, we talk about exogenous variables as those which determine whether, and not merely how, a given event will happen.

It isn't clear which way PZ uses the terms 'endogenous' and 'exogenous.' My original argument permitted a very precise meaning for the terms: variables are endogenous if they are included in the argument by which an event is explained or predicted, exogenous otherwise. Sometimes, e.g., in the quote from Alper, p. 11, PZ seems to take a view like that. But if I am right in claiming that arguments asserting sufficient conditions for socially significant events cannot be projected into the future, then those precise meanings for the terms become pretty much irrelevant. So PZ, e.g. p. 28, seems later to take "exogenous" to mean variables from outside the particular institution which is under consideration. Whether a variable is exogenous or endogenous becomes a social, historical happenstance, not a nice logical distinction. And this, as I wish to show below, is not nitpicking.

Thus, if predicting an event means to assert the sufficient conditions for its appearance, then socially significant events cannot be predicted. The reason is not, as I argued in Section I, because of epistemological distinction, much less a metaphysical difference, between past and present. It is simply that men and women today have many options open and may choose to do something different from what any precise A'-type statement might lead us to predict. Sometimes and on some matters we have more freedom; on other matters and at other times, less. I have no intention to belabor the futures-perspective as diminishing man's estate as a free agent. It is simply that the freedom which we now possess on socially and biologically significant choices makes it impossible to use general laws (i.e., those asserting sufficient conditions for an event to occur) in predicting the future.

But to do it as PZ does seems to result in the following strategy: We do not know the future because there is not fact for it to correspond to. Therefore, to remedy this deficiency in our knowledge we construct an arte-fact to which our statements can correspond. This arte-fact is perhaps a scenario, built on Delphi consensus, cross-impacted, technologized, and value-laden. Then the interventions are written backward: what is the last action sufficient to bring-to-concrete-being the projected scenario, then the penultimate, the ante-penultimate, etc. down to the present moment when we initiate this sequence of sufficient conditions.

Perhaps I read PZ pp. 53-58 wrongly; still I <u>think</u> that's what it means. But notice, that strategy depends on our <u>knowing</u> the sufficient conditions--whether small-step or revolutionary--for bringing about a socially-significant event. And we said earlier we could <u>not</u> imagine a precise, meaningful, and true A'-type statement. It is <u>that</u> failure to know the future which renders the PZ strategy inoperable. In sum, the scenario is not necessary for our knowing the future (we don't have to have an arte-fact for our statements about the future to correspond to) and it's not sufficient to remedy the inevitable absence of A'-type general statements.

To base the whole endeavor
On the writing of scenarios
Is either not too clever
Or else downright nefarious.

III

Suggestions for the Next Steps

If I am correct in my criticisms, it is easy to see how men of good will and intelligence might have fallen into the strategy presented in PZ. The alternatives I suggest may, indeed, be far less productive. But for what they're worth:

1) Educational planning for the long run must be far more radically distinguished from school-policy-planning than PZ does it. Or I should say: "does it consistently." In Section III-A of PZ that distinction is made as radical as anyone could desire, but when the political ("behavioral") realities enter, PZ tends to retreat to talking about schooling--core and periphery. Often <u>educational</u> considerations become exogenous to institutional necessities. But I would suggest that it be done exactly the other way around: We begin treating <u>only</u> education, in the full, honorific sense of the term, if you will. Given the diversity of persons, cultures, races, and values in this society (short-run) or in the world (long-run) what would it mean to become and to be an educated human being? The answer to this question would have to be given in the familiar language

of criteria for both process and produce if we are to dignify either wth the word "education."

2) Then we would have to examine what economic, technological, political, psychological, and social structures would be necessary if education (as above) is to be available to everyone in this society (short-run) or this planet (long-run). One cannot state the sufficient conditions for education; one cannot, therefore, state all the necessary conditions. But research can certainly prove of immense value in deciding whether certain structures that presently obtain are really necessary and in opening our eyes to other structures we never considered before.

3) Then we take our place in the political arena, not as advocates but as experts. If you want education, then here are the criteria you must apply to anything that bears the label. If the FDA required a proper labeling of education, its consequent high price might drive it off the market. So be it. But if you do want education, here (so far as we can determine by academic research, i.e. without calling on God's direct teaching) are the necessary conditions for its being possible. Perhaps, again, the price will be too high, and the polity will refuse to make education possible for all. Again so be it. Even if it turns out, as I believe it will, that the necessary conditions for genuine education are also the necessary conditions for the survival of Homo sapiens (so-called) on this planet, we have done what we can when we make that connection clear. As PZ recognizes explicitly, we cannot guarantee either.

FOOTNOTES

1. See Robert M. Gordon: "Emotions and Knowledge" The Journal of Philosophy LXVI, 13 (July 3, 1969), pp. 408-413.

2. See George Pitcher (ed.): Truth (Prentice-Hall, 1964), especially Pitcher's "Introduction" and Strawson's "Truth" p. 32-53.

3. See Arthur C. Danto: "Narrative Sentences," Chapter VIII of Analytic Philosophy of History (Cambridge University Press, 1968).

APPENDIX B

Critique of: "An Approach to the Futures-Perspective in American Education"

by

Jerry Miner

This review and synthesis of "American efforts to define alternative educational futures," is most useful and highly provocative. Its contribution lies not only in the synthesis of American experience and thinking about educational futures, but in raising fundamental issues with respect to the very core of the concept of future analysis and its application. Indeed, most of the issues raised in this critique devolve from as yet unresolved problems in the concept of alternative futures and its generalized application to planning and policy. The authors of this study can scarcely be faulted for inadequacies in the approach whose application and relevance to education they review. However, a preliminary critical discussion of the futures-perspective that clarified the major issues might have led to more concern for these as yet unsettled aspects of futures analysis in the review of its application to education.

The discussion which follows is divided into three sections: (1) The perspective of the study; (2) the essential features of futures analysis, and (3) futures-analysis, incrementalism, and rational policy making.

The Perspective of the Study

The futures-perspective as the authors explain essentially involves speculation about the state of social, technological, economic, political and other dimensions of the human situation in the relatively distant future. In discussing the futures-perspective it seems useful to distinguish a broad

overall conception of the future which encompasses consideration of a substantial number of elements of the future society, (e.g., economy, policy, religion, technology, military) from the specification of detailed future characteristics of a particular segment or component of one of these broader areas (e.g., education, health, recreation, transportation). For purposes of simplification, the former will be referred to as general futures and the latter as specialized futures.

An exploration of the relation between education and the futures-perspective or, as it also is termed, alternative futures, seems to demand the explication of the mutual interaction between the educational system or sector and the remainder of the societal state. That is, such a study would be primarily concerned with the relation between specialized futures of education and the general futures which encompass various global views of the state of society.

The authors, however, do not proceed along these lines. Instead, the beginning of the study contains a description of the futures approach--without substantive details regarding the areas or elements whose future characteristics constitute one or another hypothetical alternative future--and a brief discussion of some of the methods used to conjecture about the future. When the focus shifts from general futures to educational futures the discussion deals with various approaches to planning education. Here, emphasis is on the reasons for the inability of most such approaches to anticipate accurately the future state of education. The treatment of the relation between educational planning and the futures approach comes very close to being a discussion of how better to estimate or predict the character of the educational system of the future, being careful to take account of the potential pitfalls for forecasting which lie in the rapid rates of change in educational technology, in the economy and its needs for skilled manpower, and in social and political conditions.

There is, of course, nothing wrong with an attempt to describe the range of independent variables relevant to an explanation of the (future) state of the educational system, but one has the feeling that this is not

the essence of the contribution of the application of the futures-perspective to education. This essential contribution would appear, rather, to lie in tracing in detail the internal consistency between educational states and general system states. That is, if the futures approach is something other than sophisticated extrapolation or unbridled and unevaluable speculation it seems to me it is the portrayal of a number of alternative general futures each of which is internally consistent. Internally consistent in this context means that for each alternative future the characteristics of the various component elements (i.e., the economic, social, political, technological, etc.) are mutually compatible. Futures analysis unlike projection or forecasting asks not about the relative likelihood of alternative combinations, but about what combinations of various element-characteristics are most likely to appear together or at least do not involve contradictions.

The difficulty with the perspective of the study is that it fails to deal with education in this essential frame. It does not raise the basic questions of the extent to which specific educational structures are linked to particular characteristics of the state of the rest of society and vice versa. Thus, the study does not deal with the development of techniques for determination of the consistency of education structures and the structures of alternative social states. Rather it emphasizes how the educational system might respond to particular changes in the social state. This is a subtle difference, but to this critic, the difference between sophisticated forecasting on the one hand and a genuine speculative future approach on the other.

It is necessary in conclusion to remark that it is my no means clear that research on the futures approach as identified in these comments will prove to be more productive than the study of better methods of making predictions of what is in fact most likely to occur. As the next section indicates, the futures approach presents many unresolved difficulties, and may never prove to be more useful for planning and policy than sharpened methods for forecasting.

The Essential Features of Futures Analysis

Futures-perspective or futures analysis is still emerging and developing subject of study. There is as yet no conventional doctrine or set of propositions which give it definitive form. In effect, futures analysis is what those who use the term actually do. This reader has found eight essentially different features of the futures-perspective identified in the present study.

1. not a uni-linear extension of trends
2. inclusion of exogenous variables
3. a comprehensive and systematic approach
4. a multi-dimensional approach
5. elaboration of processes
6. a deliberate focus on goals
7. looking backward from future to present
8. speculation and is non-demonstratable

Many of these aspects identified as characteristic of futures analysis are also characteristic of traditional social science. Being far more familiar with economics, I will choose illustrations and comparisons from this field, but I am sure comparable points could be made on the basis of sociology and perhaps political science.

The concern for the treatment of Ceteris Paribus is endemic to social theory. Partial theories hold all but the few most relevant and highly interrelated variables constant. The variables excluded from a partial model usually are thought of as either trivial to the problem at issue or as important but determined outside of the model--that is, exogenously. The values of the important exogenous variable influences the values taken by the variables included in the model (i.e., the endogenous variables) but the values of these exogenous variables are determined by forces not encompassed by the partial model.

The specification of important exogenous variables for a particular partial model depends upon the purposes and characteristics of the model. For example, in the economic theory of the firm and industry, the exogenous elements which determine marginal cost for those firms in existence are relelvant for the short-run partial analysis, while those that determine lowest average costs are relevant in the long-run analysis.

One cannot criticize a model because it treats certain variables as exogenous. General models which in principle consider all (relevant) variables as endogenous are highly formalistic and virtually devoid of empirical content. The logic of model building or formal theory building in effect requires the addition of an equation to explain the variable every time one is added to the analysis. Very rapidly the incorporation of additional variables complicates a model or theory to the point where the human mind cannot directly infer inter-relationships. These can be specified by formal techniques, but the resulting formulations of relations among variables are far too complex for the intuitive understanding which is after all, the major objective of model building.

To a considerable extent the authors' discussion of the nature of the futures-perspective appears to ignore this basic background in their rather straightforward advocacy of increased comprehensiveness and the consideration of even more variables. If futures analysis simply takes the view that (almost) everything depends upon everything else and so models must be of the most general sort, one can respond that social scientists will know this argument and more importantly its pitfalls. If on the other hand the futures-perspective cautions one to take care not to omit important variables from models either by failing to include endogenous variables directly or by omitting to specify them as exogenous variables which a partial analysis deliberately relegates to its ceteris paribus assumptions then the futures analysis approach is simply following accepted good scientific method.

The essential point is that as the authors present it, the multi-dimensional, interdisciplinary, comprehensive elements of futures analy-

sis appear to encompass nothing more than the conventional scientific question of partial versus general analysis. Couching the discussion in terms of the futures-perspective seems in no way to extend or clarify the long-standing and well-known issues in this matter.

So also with the concern for the process by which the society moves from one to another social state. Economics in particular has developed with great refinement the distinction between alternative states or positions of equilibrium in which the endogenous variables and the process or dynamic by which the system moves from one to another of these equilibrium positions. The economic literature stresses the necessity that satisfactory static models must have a corresponding implicit dynamic such that if an exogenous change occurs the system will move toward rather than away from the new static equilibrium. Thus, economists are aware that there is a problem of "how do we get from here to there." Certainly the other social science disciplines in their theories and models also emphasize problems of process.

Again, then, the core of the future perspective cannot lie in this concern for process. One difference, here, which the authors do mention is the backward rather than forward perspective of future analysis. Perhaps this does lead to significant implications, but they are not apparent and should be spelled out.

Another element of the futures perspective is its conscious concern for the specification of goals or objectives. Continuing to take illustrations from economics, the profound and persistent impact of Lionel Robbins, The Nature and Scope of Economic Science, in which he so definitively distinguishes ends and means and defines efficient action in terms of maximum articulation between them is testimony to the awareness of the need to specify goals which has characterized thinking about economic and social policy. Recognition of the logic of the ends-means approach to policy has led to a great deal of study of both empirical and conceptual aspects of societal goals. Surely the futures-perspective is not pioneering in this area. Indeed, there appears now a sharp counter movement underway against

the ends-means conception as a consequence of developments in the theory of collective choice and in studies of the practice of public decision-making.

Thus, focus on goal specifications is a conventional characteristic of planning and policy-making which is now being challenged as a requisite of policy formulation by those in the vanguard of policy studies. It can, therefore, scarcely qualify as the essential, innovative characteristic of futures analysis.

There remains, then in this point by point review of the essentials of the futures-perspective only its speculative and non-demonstrable quality. There is, of course, no possibility of definitive contemporanious evaluation of alternative hypothetical futures, and even the failure of the future to become the present is not an indication that at the time of formulation the prospective future did not serve its purpose. But, what is this purpose and how can one judge, today, the value, relevance, or usefulness, (or whatever term one chooses to express a normative evaluation) of alternative futures? As I have indicated, my view is that the essential feature of the futures-perspective consists of the identification of a comprehensive set of dimensions for depiction of the state of society and then the development of consistent or compatible sets of values for these dimensions. To my mind, all of the other attributes assigned to futures analysis are characteristics of other well-established approaches to social science.

Futures Analysis, Incrementalism, and Rational Policy Making

In recent years students of the theory of social policy have become highly critical of what has come to be called the pure rationality approach. This method involves first a determination of the goals or ends of society along with relative rankings or weightings of such goals and second, the specification of the net contribution to the various goals made by each

available means. Policy-making then consists of straightforward formal choice of those means which attain the highest valued mix of goals. Even this brief description of the pure rationality method reveals its great similarities to the futures-perspective as described in the study here discussed. The major criticisms of this method, then, apply to the futures perspective as well.

Charles E. Lindblom has termed the comprehensive goal-means conception of policy the synoptic approach. He contends that such an approach transcends the capacity of human decision makers since it requires the consideration of an infinite number of alternative social states and an even larger number of potential policies to achieve them. In addition to the technical non-feasibility of the synoptic approach, Lindblom argues that the articulation of social or community ends is not a matter than can be determined in advance of and distinct from the determination of policies for their achievement. It is only by the very same political process in which policies are determined that the conflicts among ends are resolved. In this view there is no operational distinction between ends and means--the selection of one or another means is at the same time the decision to attempt to alter particular ends rather than others.

Lindblom's resolution of the intractibility of the synoptic method is to reduce the scope for policy to incremental decisions. Incremental policy-making is, in any case, the method characteristic of real-world public decision-making. Attempts to replace this traditional practice by wide-ranging consideration of alternative ends and/or means is bound to founder on the twin difficulties of the impossible informational requisites of the synoptic conception and the impossibility of the derivation of collective preferences other than through the process of decision-making itself.

It seems clear that the futures-perspective is a most extreme kind of synoptic conception. What can be said for it against Lindblom's attack? Yehezkel Dror, the Israeli theorist of public policy has pointed out in Public Policy Making Re-examined, (1968) that even if one concedes most of Lindblom's argument, the rapid pace and increasing pervasiveness of

social and technological change tend to create problems whose solutions, if any exist, are not to be found through incremental change. For such problems a coordinated, consistent, and comprehensive modification of the social state is necessary, and incremental methods are not capable of planning policies to achieve such change. As problems of this sort emerge and become discernable not only to a perceptive few but to the bulk of the members of society, agreement on ends well may emerge without the political conflict characteristic of agreement on incremental change.

Futures analysis appears precisely to be a technique directed to these questions of non-incremental change. In order for it to be an effective tool of policy rather than an outlet for imaginative productions methods must be devised for limitation of the alternatives considered to manageable numbers, for specification of how the treatment of the inter-relations among the components of the (future) social state differs in futures analysis from that of the more sophisticated practices of the traditional social sciences. Even if these are accomplished, futures analysis or any other approach still must face the most fundamental issue in long-run policy and planning: how to attain sufficiently wide-ranging agreement among the members of society to permit undertaking programs of a non-incremental sort which are necessary to create one or another of those alternative futures which embody a humane society.

APPENDIX C

A BRIEF REVIEW OF PERTINENT RESEARCH UNDERWAY AT
THE EDUCATIONAL POLICY RESEARCH CENTER AT SYRACUSE

by

Warren L. Ziegler, February 1970

Methods for Thinking about Alternative Futures (see Part I-B)

The thought that the future is best approached from the standpoint of alternatives continues to be a most complex conceptual framework when applied to problems of policy formulation and implementation through planning. Underlying much of the early work of the Syracuse Center in its employment of Delphi forecasting techniques, of cross-impact matrices as a device for analyzing more comprehensive alternative futures, and of scenario construction, was the assumption that these methods provided a "value-free" approach to the future, in the positivistic tradition. As research on the methods moves along, it is becoming clear that this and other key assumptions must be challenged on a number of grounds.

Delphi

First, on the basis of research and conceptual analysis conducted by W. Timothy Weaver, serious questions have been raised about the utility of Delphi as a forecasting device in the strictest sense. It may well be that the main value of Delphi lies in its heuristic strength, i.e., providing the Delphi forecasters an opportunity to make explicit their own assumptions and judgments about the future. Experiments conducted by members of the staff at the Syracuse Center with various policy and planning groups in the United States appear to indicate that Delphi-like procedures represent a powerful way of getting the participants to examine the values, beliefs, and attitudes which underlie their assertions about the future, irrespective of the quality of their substantive forecasts. Research continues on this point. A preliminary "working draft," "Delphi as a Method

for Studying the Future: Testing Some Underlying Assumptions," sets forth some of this work.

Secondly, serious questions must continue to be raised about the "quality" of substantive Delphi forecasts, particularly in the social domain. It has become clear that the specificity of forecasts expected of a Delphi application is difficult--is not impossible--to achieve in the areas of social, political, institutional, cultural, and ideological behaviors--at least in the present state of the art. What is an "event" in the social domain? When does a social trend, at some level of aggregation, reach a significant level? How is that level defined, and what do we mean by significant? How is that trend translated into an event which can be defined and specified with sufficient precision to ensure that its meaning is clearly understood by all concerned--particularly if they do not share political beliefs or common cultural understandings? Moreover, what does the attachment of a number representing a subjective probability estimate mean to a group of policy-makers or planners when they are confronted with a series of forecasts supposedly arrived at through an objective methodology. In the past six months, two reports of Delphi investigations conducted by the Institute for the Future at Middletown, Connecticut, with the support and participation of the EPRC/Syracuse have been published and are available from the Institute for the Future, Middletown, Connecticut. They demonstrate the difficulty of making Delphi forecasts in the social domain and using the results for the analysis and assessment of policy options within the context of long-term alternative futures. They are: "Forecasts of Some Technological and Scientific Developments and their Societal Consequences" and "Some Societal Developments: 1970-2000."

Third, the now "classical" Delphi interrogation appears to lack one critical component--it possesses no explanatory power. Yet an explanation of the substantive reasoning underlying a particular response to the Delphi question, i.e., a "forecast," would appear to be crucial, since it would provide additional grounds which would allow the independent observer or user to assess the quality of the forecast. Work now underway at the IFF is attempting to modify Delphi so as to increase its explanatory power.

Cross-Impact Matrix

Since Delphi as a method for forecasting the future represents an important ingredient in the application of cross-impact matrices and other devices for constructing alternative futures, serious--though perhaps not insurmountable--difficulties have been discovered in these applications. Mr. Lawrence Hudson discusses some of the difficulties and problems encountered in using cross-impact devices in a "working draft" entitled, "Uses of the Cross-Impact Matrix in Exploring Alternatives for the Future." Chief among the difficulties, of course, is the question of the substantive judgments required in filling the matrix cells. The question of whether and in what manner event A, if it were to occur, would impact upon the likelihood of event B, goes to the heart of social theory. Experience now amply demonstrates that the quality of output from a cross-impact analysis is very much determined by the quality of analysis and judgment which goes into filling the cells. That, however, is not a simple, technical act. It represents the application of sophisticated social science analysis, which in turn is derived from the present level of adequacy of social theory as an explanatory tool.

Questions of Values

Perhaps the most important recent developments at the Syracuse Center in the employment and refinement of these methods for viewing the future is a growing recognition that a "value-free" approach is an inadequate foundation for erecting intellectual and policy-relevant constructs about the future of education or any other area of institutionalized human behavior. It is clear that even in so-called objective analysis of the future, employing these methods, we are at present unable to distinguish clearly forecasts--which derive from the idea of non-intervention--from statements or feelings about what the future may hold--which derive from attitudes, values, and beliefs. Further research is underway in this area, but no quick answers are expected.

Even apart from the question of forecasting, per se, one must raise the question of how a Center, supposedly engaged in value-free policy analysis and assessment, construes its own organizational and ideological

role vis-a-vis those agencies and persons who hold or claim responsibility for planning and decision-making. The answer to that question goes to the heart of the role of the intellectual and social scientist qua policy advisor. That old and hoary question is now exacerbated by the addition of the futures-perspective to the armory of conventional policy analysis, technical planning, and "think-tank" operations. The Syracuse Center is approaching the question of its own role as openly and critically as it can. A "working draft" entitled "Beyond Progress: On Four Post-Modern Futures," by Manfred Stanley, sets the stage for this inquiry. Employing the classical methods of exegetical analysis in the sociology of ideas and knowledge, Stanley categorized three pervasive and historically enduring ways of viewing the future and indicates, in his judgment, their inadequacy for confronting the increasing tensions and crises of contemporary human existence. The fourth quasi-scenario, called the "Questive Society," is then posited as a possibly fruitful alternative for the development of human and social behaviors adequate to deal with the enormous complexity, interdependence, and potential destructiveness of scientific, technological, and social change on all fronts.

The line of inquiry is carried further in a second paper, soon to be available, co-authored by Professor Stanley and Professor Robert Wolfson, entitled "Beyond the Invisible Hand: Policy Advisors and Their Clients." The emerging self-conception of the Syracuse Center, which this paper attempts to explicate, is that the traditional role of policy analysis carried on by many organizations, both within and outside the academic community, is indeed not value-free, but representative of a pragmatic, political consensus. This consensus has, at least until now, been unable or unwilling to come to grips with the institutional propensity to neglect and, in some cases, to promote the vast wastage of our natural resources and common "free" goods of air, water, and minerals. The result is to pollute and perhaps destroy the underlying "givens" of all human existence, at least as we know it. Indeed, the very forecasts, whether emanating from Delphi procedures or from more conventional trend extrapolation, which the Syracuse Center is employing now in the construction of pictures of the future, are so dismal with respect to the likelihood of survival of humane values as

to call into question society's will and ability to invent the social and political institutions--and to promote changes in underlying human attitudes and behaviors--even barely adequate to control and reverse these ecological developments. We are thus confronted with the role and function of educational systems: in what ways might education contribute to the development of attitudes and skills appropriate for supporting, perhaps engendering, fundamental systems breaks and the social, political, and human experimentation which may now be called for?

Policy Analysis

Of particular relevance to the application of the futures-perspective to assessing alternative policy options in education in the United States is the work of Mr. James Byrnes, with other members of the Center staff, in a project whose objective is to analyze major alternatives for post-secondary education. A quantitative model describing the behavior of the formal, or core, education system over the past 100 years has been developed with some rather provocative findings. The model, and some of its applications, are set forth in a report which was made available in February 1970, entitled "The Quantity of Formal Instruction in the United States."

At the same time, work on the concept of the "learning force" has progressed to the point of the publication of a major paper entitled "The Learning Force: An Approach to the Politics of Education," written by Mr. Stanley Moses.

Educational Planning: Process and Pedagogy

In the continued review of educational planning as currently practiced in the United States, the contention of this paper that a longer term, comprehensive model for planning for alternative educational futures has not yet been developed or applied appears to continue to be borne out by the evidence. In the hope of developing such a model by working directly with educational planning and policy groups at various levels of the system, the Syracuse Center has taken a number of initial steps to commence the translation of the futures-perspective into operational planning terms. Two

rather extensive and comprehensive simulation exercises have been developed by Mr. Stuart Sandow which provide an opportunity for planners to employ the Delphi, Cross-Impact Matrix, Scenario Construction, and Futures-History Analysis tools for the formulation of futures environments, including the specification of alternative long-term goals and an analysis of their consequences within the larger society. These exercises are considered essentially as heuristic rather than forecasting devices. The objective is not to teach planners how to "do" long-term planning for alternative futures, but to provide an environment within which they can begin to examine some of the ways this might be accomplished, and to consider the ramifications for current problems and policy were such procedures to be used. Of particular interest is the employment of the cross-impact matrix techniques to assess alternative tasks, programs, and goals against each other in terms of their reciprocal enhancing and inhibiting effects. This new technique, called a "Cross-Purpose Matrix," appears to be particularly useful in engaging professional planners in a consideration of the consequences of their programs for goals and the programs necessary to attain them generated in other sectors.

Along with this initial work in applying the futures-perspective to "real-life" situations confronting planners and policy-makers is the initial development of a pedagogical/training model by W. Timothy Weaver. A preliminary prospectus is now available. This model--still in its formative stages--melds some of the conceptual work of Dr. Eric Jantsch with the various futures-casting techniques discussed in this paper.

Also on this front is the completion and preliminary publication of a comprehensive international bibliographic survey of educational planning by Maureen Webster, with the assistance of Professors Don Adams and Jerry Miner. It is expected that a published version of this bibliography, which will cover the decade of the Sixties, will be available shortly.

This brief survey of work underway at the Syracuse Center since the preparation of the report for OECD should give the reader some indication of how the Center is itself commencing to apply the futures-perspective to educational policy and planning.

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